

British Society for the  
Study of Orthodontics.  
1932



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TRANSACTIONS

OF THE

British Society for the  
Study of Orthodontics

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1932

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1933 Officers and Councillors are given on page 86.

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The attention of members is drawn to the change of Headquarters from THE INSTITUTE OF HYGIENE, 28, PORTLAND PLACE, to MANSON HOUSE, 26, PORTLAND PLACE, W.I. All communications should be addressed to the Hon. Secretary, Mr. R. CUTLER, 8, Lower Sloane Street, S.W.1, or 3, Walpole Road, Surbiton, Surrey, or to any other officer particularly concerned.





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# British Society for Study of Orthodontics

[January 1st, 1933.]

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# The British Society for the Study of Orthodontics.

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AN ordinary meeting of the Society was held at the Institute of Hygiene, 28, Portland Place, W.1, on Monday, January 18th, 1932, Mr. CARL SCHELLING, President, in the chair.

The minutes of the annual general meeting held on Monday, December 7th, 1931, were read and confirmed.

The PRESIDENT announced that the committee had been discussing the matter of how best the Society might become acquainted with the advance on orthodontics in foreign lands, and he had been instructed to ask all members who should happen to come across any unusually important foreign literature to make a note of it and kindly inform Mrs. Lindsay with a view to all the members having the benefit of any new discoveries made abroad in the science of orthodontics.

The PRESIDENT then delivered his presidential address.

Mr. ROBERT CUTLER read a paper, "A NEW PREPARATION OF BRITISH STAINLESS STEEL."

## A BRIEF SURVEY OF ORTHODONTICS.

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By CARL SCHELLING, L.D.S.Eng.

WHEN Mr. Pitts so gracefully endued me with the badge of office at our last meeting, the hour was very late, and my reply was very brief, so I feel that I must preface my address by expressing my gratitude more adequately to the Society for the honour it has conferred upon me in electing me its President, and to promise to do my best to follow the example set to me by my predecessors by serving the Society to the best of my abilities, and by asking in advance your kind indulgence for my shortcomings, of which you no doubt will become aware increasingly as the session proceeds. My remarks will be somewhat discursive, but mainly in three parts.

Firstly, the origin of the Society's name, then remarks as to the desirability of possessing normal teeth and jaws, with various authors' descriptions of the jaws and the teeth and their articulation, and facts from the works of veterinary surgeons and comparative anatomists which may throw light upon the etiology of irregularities of the teeth of man.

One day about the end of 1908, when the late Sir Herbert Warren, at that time President of Magdalen College, Oxford, was in my consulting room, his eye chanced to fall on a notice headed "British Society for the Study of Orthodontia," and he turned to me with a quizzing look and asked me what "orthodontia" meant. I replied that it was the word used by an American as part of the title of his book and adopted therefrom by the Society, but that if he, as a classical scholar, took exception to it, and would give me his reasons in



writing, I would gladly bring the matter before the committee, of which the members, I felt sure, had no more desire to be scorned by classical scholars than I had myself! He then suggested my writing to the Rev. Dr. Sir James Murray, editor of the Oxford Dictionary, and I did so, and received a lengthy reply, which I had hoped to find in our minute book, stating various objections to the termination in "a" being made to Greek words, and suggesting on the analogy of music and logic, or physics and statics, either ending in "c," or "cs" for euphony, and adding that there might be a use for "orthodonty" as describing the condition of a patient, who after treatment has attained straight-toothed-ness! The Germans now use *Orthodontik*, being sticklers for correctness in such matters.

I wrote a letter which put before the council of the Society, on February 10th, 1909, some information on the etymological defectiveness of the word *Orthodontia*, and received a reply saying that the council would be glad of suggestions to propose a change in the name of the Society at the next general meeting in December, 1909.

On March 10th, 1909, the suggestions were considered by the council, and I was thanked for them and told that the members appreciated my efforts to arrive at the correct wording of the name of the Society, and on November 10th Mr. H. Baldwin moved, and Mr. J. H. Badcock seconded, that a change in the name of the Society was desirable, and that the word *Orthodontia* be changed to *Orthodontics*.

On December 8th, 1909, the council recommended the change of title to "The British Society for the Study of Orthodontics," and as the originator of the suggestion I explained to the annual general meeting why I introduced the word *Orthodontics*, and on February 11th, 1910, the Hon. Secretary was instructed to make the alteration in the Society's book plates and bulletin board as far as the name of the Society was concerned. Dr. Angle, after all, cannot be considered a sure guide in such matters, as even in his seventh edition the term "*fraenum labii*" is erroneously given as "*frenum labium*."

On my recently telling Sir Arthur Keith of the suggestion of *Orthodonty*, he replied that he had always understood it to refer to regularity, rightness, rather than uprightness or straightness.

The five lectures on the growth of the jaws, normal and abnormal, delivered under the auspices of the Dental Board of the United Kingdom in 1924 by Professor E. Fawcett, and Professor J. C. Brash (whose description of the mode of growth of the upper jaws and the face as a whole and in which he acknowledges his indebtedness to Sir A. Keith and Mr. G. G. Champion, is without a rival), Mr. G. Northcroft and Sir A. Keith contain such a mass of original observation that I dare not attempt to summarise them, but do advise anyone who thinks himself acquainted with the subjects to read them, if he has not already done so, and he will begin to learn what great work has been done on the subject. These remarks apply also to the lectures by Sir J. F. Colyer delivered in 1930, also under the auspices of the same authority. The word *Orthodontia* does not occur in the Oxford Dictionary, 1909, edited by Sir James Murray. Dr. E. H. Angle, in the 1906 seventh edition of the "*A System of Orthodontia*," commences chapter one with the words—"Orthodontia is that science which has for its object the correction of malocclusion



of the teeth, from the Greek *orthos* (straight), and *odous* genitive case *odontos* tooth."

In the chapter on "Occlusion," p. 14, Dr. Angle shows three beautiful types of normal occlusion, and remarks: "None is absolutely perfect. Probably nature never makes the truly ideally perfect type in every particular. Each of these dentures slightly differs from the others: in the position of the denture as a whole, in its relation to the skull, in the angle of inclination of the incisors as well as of the other teeth, in the sizes and typical patterns of the teeth, in the length of cusps and consequent over-bite of the incisors, in the sizes, width, and curves and arches, as well as in the compensating curves of the plane of occlusion. Yet these variations are but natural, and doubtless in perfect keeping with the distinctive individual types, and we insist that in the main the dentures are exactly alike in Nature's plan of the normal in human dentures. If all were alike in every particular it would necessitate that the three individuals represented by them also be essentially alike in every other particular."

E. H. Woerpel writes: "The ideal of the Roman type, though markedly different from the Grecian, was also closely followed by their painters and sculptors, and where types and religious ideals were so distinctive and so closely adhered to, there could be certain standards and laws to cover them, especially in creative art, but to use the Grecian or the Roman standard as a standard for the types of the present day, especially in America, is impracticable, for our inheritance, our occupations, our mental activities, our habits of thought, our social and climatic conditions, etc., etc., differ so radically and all those play such a vital part in the moulding of the mental, moral or physical, as expressed in our whole bodies, and especially in our face, that a standard type is an impossibility. The tendency of modern civilisation seems to be to create a law for each individual, and in the face of complex and constantly changing conditions a fixed type as a basis or standard to govern the moulding of the human face cannot be established."

Angle's conclusion in 1903 was that "the best balance, the best harmony, the best proportions of the mouth in its relations to the other features require that there shall be the full complement of teeth and that each tooth shall be made to occupy its normal position—normal occlusion.

"An interesting fact, which the author also believes to be convincing proof of what has already been said relative to harmony of facial lines depending upon harmony of occlusion, is the wonderful harmony of facial types with the types or patterns of the teeth: how the broad and squarish type of tooth harmonises with a similar type of face."

A few quotations showing the high esteem in which beauty of the teeth and mouth has been held. Though I had recourse to a Shakespeare Concordance, I found no reference bearing on the subject except the description "white as whalebone" in "Love's Labour Lost." This, Dr. Gollancz says, means the tooth of the walrus, which was formerly used as the material from which artificial dentures were made.

Song of Solomon I, v. 2: "Thy teeth are like a flock of sheep that

are even shorn, which come up from the washing whereof everyone beareth twins, and none is barren among them."

The value of slaves by the Dutch was lessened by two dollars for each tooth lost, and pedigree dogs prices have been very greatly influenced by the condition and regularity of their teeth when shown in competition.

A master of hounds once called my attention to his being "hog-mouthed," a term in common use to describe anterior projection of the lower incisor teeth!

Thomas Carew—"In praise of his mistress."

"Leaves of crimson tulips met  
Guide the way  
Where two pearly rows be set  
As white as day;  
When they part themselves asunder  
She breathes oracles of wonder."

Also from "The Comparison":—

"Thy teeth in white do Leda's swan exceed."

Edmund Waller, the poet, who died in 1687, expressed his detestation of "ill teeth" in the "Epigram on a Painted Lady."

"Were men so dull they could not see  
That Lyce painted; should they flee  
Like simple birds into a net,  
So grossly woven and ill set:  
Her own teeth would undo the knot  
And let go all that she had got.  
Those teeth fair Lyce must not show,  
If she would bite; her lovers though  
Like birds they stoop at seeming grapes,  
Are disabused when first she gapes:  
The rotten bones discovered there  
Show 'tis a painted sepulchre."

Avicenna, Arabian, first used subluxation, and Peter Forest in the sixteenth century. Mouton (1746) for toothache, stretched the dental nerve by subluxation. Bourdet (1757) removed the first premolar to let the canine erupt, and on the unaffected side to preserve symmetry. For too large and ugly arches he extracted all four premolars, where the deformity is only in the lower jaw he extracted first molars immediately on eruption after the manner of Caparon. Jourdain (1759) described an improved pelican for straightening teeth inclined inwards. John Hunter (born 1728), to correct protrusion of the upper jaw advised the extraction of a bicuspid tooth on both sides, and "to regulate the incisors it is sometimes necessary to rotate on their axes with forceps. In certain cases of protrusion of the lower jaw one may have recourse with advantage to the inclined plane."

It is not uncommon to find the lower jaw projecting too far forwards so that its fore teeth pass before those of the upper jaw when the mouth is shut; which is attended with inconvenience and disfigures the face. This deformity can be greatly mended in young people. The teeth in the lower jaw can be gradually pushed back in those whose teeth



are not close, while those in the upper can be gently brought forward which is by much the easiest operation.

These two effects are produced by the same mechanical powers. While this position of the jaw is only in a small degree so that the edges of the underteeth can by the patient be brought behind those of the upper, it is in his own power to increase this till the whole be completed ; that is, till the grinders meet ; and it is not necessary to go further. This is done by frequently bringing the lower jaw as far back as he can and then squeezing the teeth as close together as possible.

Also in Chapter VII, " The means of making this pressure I shall only slightly describe, as they will vary greatly according to circumstances ; so considerable indeed that scarcely two cases are to be treated alike, and in general the dentists are tolerably well acquainted with the method."

Chapter VII. Hunter advises the extraction of the upper last grinder when it bites upon the lower gum, the corresponding tooth not having erupted.

J. R. Duval, of the Society of Medicine, Paris, read a paper on the advice of the ancient poets on the preservation of the teeth, from which he selected : " How can I describe the beauty of her teeth, which she presented to the view in the act of laughter ; white, equal, closely and compactly placed, they presented in their arrangement the image of a fine necklace formed of pearls, the most regular and the most brilliant."

Duval also : " We often see the canine teeth ignorantly drawn when they are irregular instead of the first grinder. When these teeth have been irregular I have always drawn the first bicuspid, and have invariably found that the canine has descended into its place." He also quotes several cases of children who have been born with from one to six teeth.

Again—" and of persons of sixty, four-score, a hundred or even a hundred-and-twenty, have cut new teeth. Epitaph suggested :

' Here lies an old person once toothless and hoary  
Who renewed all his teeth, his health and his hair,  
And then was cut off in the height of his glory  
After living two ages devoid of all care.'

" What exquisite delight a tender mother feels when the last of the twenty milk teeth has made its appearance : the lovely smile of her infant, to which the presence of these teeth adds such a charm, is no longer mingled with disquietude ; their whiteness and regular arrangement are objects of her admiration and already inspire a hope that those which are to succeed will possess the same advantages."

A few early observations on the treatment of dental irregularity. P. Fauchard's translated by Mrs. Lindsay :—

" Sixth observation in 1712 : This young girl had two teeth on the right side of the upper jaw very badly out of place and inclined inwards on the side of the palate. To regulate these two teeth I used the pelican. I operated on them and put them in their natural place, without giving her much pain. I tied these teeth with thread

as usual in order to keep them in place and to avoid the spring of the alveolus and the gums from bending them back again. I succeeded so well that it did not seem that she had ever had distorted teeth; eight days after I took off the thread and the teeth of this young lady remain firm and regular."

My own grandfather, I was told by an eye-witness, lifted to its proper level a right lower canine tooth which was so low in the arch as to be not noticeable: it remained *in situ* and became firm with no aid beyond the frequent application of the child's finger to the region of the apex of the tooth, to keep it from sinking back.

Arthur Thomson, in "Anatomy for Art Students," says: "The facial angle ranges from 62 to 85 degrees. The former indicates a very marked projection, the latter a more vertical outline. Commonly the angle measures from 70 to 80 degrees, the white races being characterised by the facial angle of from 75 to 80 degrees, the yellow by an angle which ranges from 70 to 75 degrees, while the negroid races display a projection of the lower part of the face which often causes the facial angle to fall below 70 degrees. In other words, the European races have more or less straight faces: the yellow slightly sloping faces: and the black markedly projecting faces. In the latter this is further emphasised by the presence of a broad and flattened nose and thick and everted lips.

"In the more highly civilised races, as we have seen, the face is much straighter, and this may account for the ideal forms represented in the antique in which no doubt a sense of dignity is imparted to the features by the undue emphasis of this condition. In some of these the facial angle exceeds a right angle, a condition not met with in man under normal circumstances. Subjected to these tests, many of the types represented in the antique are impossible, yet in spite of all such criticism they still remain the embodiment of all that is great and noble in art."

The size of the teeth varies in different individuals. The lower races of man as a rule have larger teeth than the more highly civilised. This is no doubt accounted for by the fact that the higher races pay more attention to the preparation of their food by cooking. Large teeth require large jaws, and we can thus account for the massive lower jaws met with in many savages. Too big a jaw imparts a brutal appearance to the face, a feature which draughtsmen have often emphasised in representing the criminal type.

In some, owing to the feeble development of the lower jaw, the chin, instead of being prominent, recedes. This imparts a feeling of weakness to the whole face, in striking contrast to the look of strength and determination associated with a square jaw. The lips should be full and rounded, the red parts being clearly defined from the rest by a more or less prominent margin. The upper lip should project somewhat so as to throw part of the under lip in shadow. The form of the upper lip is often a feature of great beauty. From the angles of the mouth the red part of the upper lip should curve over so as to form an arch, the centre of which however is interrupted by a gentle groove across its middle from the septum of the nose. As this groove joins the red edge of the lip it breaks the continuity of the curve and imparts to it that characteristic appearance which has been named "Cupid's bow." It is just where this groove



breaks the outline that the lip is most prominent. The upper lip varies considerably in length in different individuals, a short lip being regarded as one of the attributes of ideal beauty. The lower lip, though full, should not project so far forwards as the upper."

The teeth are not even mentioned in this connection, though the position of the lips depends largely on that of the teeth beneath them.

"Cunningham's Anatomy," sixth edition, p. 1230-1: "The complete or typical mammalian dentition in its highest development, as in the horse, is represented by the following formula :

$$\begin{array}{ccccccc} 3 & 1 & 4 & 3 & & & \\ 1 - c - pm - m - & - & 4 & 4. \\ 3 & 1 & 4 & 3 & & & \end{array}$$

In the dentition of man, therefore, one incisor and two premolars are wanting. Different views are held as to which have been suppressed—most probably they are the second incisor and the first and second, or first and last premolars. In general it may be said that the dentition of the lower races differs from that of the higher, in that the dental arches are squarer in front, the teeth larger, and more regular, the canines stronger, the last molars better developed, and the tubercles on the molars more perfect, in the lower than in the most civilised races. It may be mentioned that the teeth of a savage man, if seen in the mouth of a European, would be looked upon as an 'exceedingly perfectly formed set of teeth' (Jones).

"To express the proportion in size of the crowns of the premolars and molars to that of the skull in different races, Flower compared the distance from the front of the first premolar to the back of the last molar *in situ*, with the distance from the front of the foramen magnum to the naso-frontal suture (basi-nasal length) in the form of a dental index,

$$\text{Thus: } \frac{\text{length of teeth} \times 100}{\text{basi-nasal length}} = \text{dental index,}$$

and by this means has divided the various races into *microdont* (index 42 to 43, Europeans, Egyptians, etc.), *mesodont* (index 43 to 44, Chinese, American Indians, negroes, etc.) and *macrodont* (index 44 and upwards, Australians, Melanesians, etc.)."

p. 1118. "Arrangement of the teeth in the jaws: The teeth in each row are arranged in a crossed row—the arcus dentalis—of approximately a semi-oval form. The curve formed by the upper teeth, arcus dentalis superior, however, is wider than that formed by the lower set, arcus dentalis inferior, so that when the two are brought into contact the upper incisors and canines overlap their fellows in front, and the buccal tubercles of the upper premolars and molars overlap the corresponding ones of the lower teeth. It will also be seen that, as a rule, the teeth in one jaw are not placed exactly opposite their fellows, but rather opposite the interval between two teeth, in the other jaw. That arrangement is brought about largely by the great width of the upper central incisors as compared with their fellows of the mandible, which throws the upper canines and the succeeding teeth into a position behind that of the same named teeth of the lower set. But as the lower molars are larger in their antero-posterior diameter than those of the upper row—and this remark applies particularly to the third molars—the two dental arches terminate behind at approximately the same point.



"The upper dental arch is said to form an elliptical, the lower a parabolic curve. The line formed by the masticating surfaces of the upper teeth as seen on profile view, is usually somewhat convex owing largely to the failure of the third molar to descend into (line with the others. Similarly the line of the lower teeth is as a rule concave. In both jaws the crowns of the front teeth are higher (longer) than those of the molars."

W. C. Miller's "Veterinary Dictionary," p. 961: "The teeth of the domesticated animals when compared with men, are extraordinarily free from disease in the strict sense of the term.

"Irregularities. In dogs there may be a discrepancy in length between the upper and lower jaws. In bulldogs, pugs and other breeds of dogs with very short upper jaws, the undershot condition is practically normal, while in certain breeds with extremely long upper jaws the overshot jaws are very common."

To this should be added the observation of Sir J. F. Colyer on dogs—borzoi, greyhound, Aberdeen terrier, bulldog, fox terriers. He gives tables of the average lengths of their jaws and length of teeth, and says: "The study of abnormal positions of the teeth in animals would seem to indicate that when a species or genus is varying in the direction of a shortening of the jaws, the teeth also tend to diminish in size so bringing about a shortening in the length of the teeth series, but the shortening of the teeth series does not relatively keep pace with the shortening of the jaw. It is not, therefore, unreasonable to assume that this apparent reluctance on the part of the teeth to vary and adjust themselves in proportion to the jaw shortening is an important factor in the production of abnormalities in position of the teeth."

With regard to long and short muzzled bears he remarks that there is evidence that reduction in the size of the jaw may take place at a greater rate than in the growth of the teeth. And it would seem that there is no adequate support for the view that the teeth in any marked degree influence the growth and development of the jaw. "In other words, the development of abnormalities other than those traceable to accidental causes, such as injury, sepsis, etc., is due to the universal tendency of living things to vary."

"Opinions as to the proper treatment of abnormal arrangements of the teeth differ widely, and the lack of agreement on the subject is due in great measure to the fact that our knowledge of the etiology and pathology of these conditions are still very imperfect. The subject has been approached too often from points of view restricted to the local conditions with the result that inquiry into general causes has been somewhat neglected. The study of periodontal diseases in the lower animals has increased our knowledge of the etiology and pathology of that condition, and I am sanguine enough to believe that an extended survey of the animal kingdom would solve many of the problems confronting us in our quest for knowledge as to the causes of the abnormal arrangements of the teeth in man."

Some twenty-four pages follow, giving what I suppose must be the most extensive survey of the irregularities of the teeth of the primates ever made.

To bring these remarks up to date—G. R. C. Stephens, *Lancet*,



November 21st, 1931, p. 1159—Nigeria. “Among the pagan natives the circumcision is done either by an old woman, or the blacksmith, who also files the teeth of the children to make them more handsome in appearance. Which brings to mind the statement ‘In order to speak the Jewish tongue with more grace St. Jerome caused his teeth to be filed.’ ”

When I started this address I had not read Mr. G. Northcroft’s paper on the teeth in relationship to the normal and abnormal growth of the jaws. When I did I found it had dealt so ably with many of the points which I set out to study, that I did not pursue the subject, but have purchased two books from the Dental Board and present them to our library, so that those as ignorant of these admirable lectures as I was can have no excuse for not being enlightened! They can also there read “concerning certain structural changes which are taking place in our jaws and teeth,” by Sir Arthur Keith—short, but crammed with interesting observations.

At our last meeting we heard a good deal about the importance of securing the patient’s co-operation; this was impressed upon me forty-six years ago by an old Quaker dentist, Mr. Fox, of Exeter, who related how a young lady about to be married was so anxious to perfect her beauty by getting an instanding upper lateral incisor into its proper alignment, that on his inserting a silver plate struck to cap the lower teeth and carrying an inclined plane of gold soldered to it, he found that she had bitten the misplaced tooth into line with its neighbours within a fortnight from the day of insertion of the appliance.

To those who have found this paper long and prosy my excuse must be that when I commenced it I intended it to be short, but the Hon. Secretary, alas, informed me that we were to be denied the very interesting kinema show which had been promised, so that I had to hold forth for a longer time than was originally intended. Never again will I take up so much of your time, but an inaugural address is, as you have experienced, to be taken very seriously, and the Reader is for the nonce privileged!

#### DISCUSSION.

Mr. PITTS said he desired, on behalf of his fellow-members, to propose a very hearty vote of thanks to the President for his most entertaining address, so full of interesting and whimsical observations. It was, he ventured to say, an address of a kind in its scope and versatility that they had not had hitherto in the annals of the Society. The President had, in Browning’s phrase, “ransacked the ages, spoiled the climes,” and, as another poet had said, “surveyed mankind from China to Peru.” He (Mr. Pitts) felt sure that anybody who was anxious to know what poets, dramatists and others had thought about the subject of teeth and their irregularities, would find in the President’s address an indispensable source of delight. He felt that he could not contribute anything in the way of discussion, but he would just say, as illustrating the æsthetic point, that he had been rather interested the other day when going through the papers read at the Orthodontic Congress to see that in the course of the discussion on a paper on the treatment of malocclusion by extraction, read by Mr. Chapman, one of the speakers—an American—had disapproved of extractions because, he said, from the point of view of Americans they gave the face a pinched expression, and he had added, “We in America like a full type of face with rather prominent teeth adapted for the most efficient mastication.” There one had rather an interesting sidelight on how the æsthetic factor varying in different countries might set up a sort of

orthodontic standard. He had much pleasure in moving a hearty vote of thanks to the President for his presidential address.

The motion was seconded and carried with acclamation, the PRESIDENT briefly acknowledging the vote.

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#### A NEW PREPARATION OF BRITISH STAINLESS STEEL.

By ROBERT CUTLER, L.R.C.P., M.R.C.S., L.D.S.

A STORY is current of a noted English playwright and dramatist, who whilst on a journey through America, visited Chicago ; he was asked by the mayor what he thought of the country and of that city in particular, and it is reported that the great man replied that the further West he went the more convinced was he that the Wise Men came from the East. An answer to my mind indicative of a very proper racial pride and illustrative of the new mood or temper that, happily, is at last beginning to pervade this island country of ours. We are doing away with the foolish superstition that any material or system that emanates from abroad is necessarily superior to our own, and are noting with gratification that we have no cause to be ashamed of our own products and achievements.

Indeed, many examples immediately leap to mind ; not more than six years ago the Ford and the Chrysler ranked amongst the most popular cars on English roads, at present not less than eighty per cent. of cars in this country are of British or Empire make, whilst the Austin Seven is manufactured under licence in America where it has scored a signal success and has largely rehabilitated the fortunes of the contracting firms.

In France, too, the Austin is manufactured under the name of the Rosengart car, where it enjoys a like popularity.

Six years ago, Italy and America had both won the Schneider Race, and it then seemed destined that the Trophy would remain in the



South, now the cup has its permanent resting place in the Royal Aero Club in Piccadilly and our aeroplane engines can be built to a weight power ratio unequalled by any other country, whilst our aeroplanes are bought by such countries as Rumania, Belgium, Sweden, Japan, Brazil, and the Latin American countries. In the making of optical instruments the advance has been no less striking and quite recently both France and America have adopted, and manufacture under licence, the new type of submarine periscope employing British wide angle prisms and lenses, and this after the most stringent competition with home products. I would not however weary you by amplifying such a list, but would prefer to bring to your notice a new British product of considerable interest to us as Orthodontists.

As you know, the profession has been quick to perceive the virtues of stainless steel in the form of both plate and wire more especially when, about three years ago, an extremely tough and resilient example of the latter was produced by the Krupp firm. It has in fact been standardised in the Orthodontic department of Guy's Hospital for more than two years and its use is now spreading to other centres of teaching and to the bulk of progressive practitioners.

It is extensively used in Germany, and Paul Simon is one of its chief protagonists. In the past two years attempts have been made to secure wire of British origin fabricated to the same specification without much success, but latterly the uncertainty of supply and depreciation of sterling have rendered a home source essential, and I am happy to bring to your notice at least one grade of English wire which test shows to be in no way inferior to the Continental product.

As you know, non-corrosive steels became increasingly employed during the latter years of the war, since which time the Firth Steel Company have developed certain different forms for various uses, of which the two main groups are of interest to us. Firstly, there is the "Martensitic" type containing 14 per cent. chromium and a varying carbon content, this is a true non-corrosive tool steel responding well to heat treatment for the purpose of tempering: such a form is well suited for the making of cutting instruments, but not for use in the mouth, as its malleability is not high, whilst a measure of discoloration eventually occurs. Secondly, there is the "Austenitic" type containing 18 per cent. chromium and 8 per cent. nickel, examples of these being Firth "Staybrite" and Krupp "Wipla" Steel. These are not susceptible to heat treatment, but cold working processes can produce any degree of hardening or spring temper from the original soft and quite malleable state. As this form is completely resistant to corrosion, provided it is not subjected to a temperature of more than 400 deg. Centigrade, it has many of the qualities considered essential for use in the mouth. In this connection it might be well to consider the specific advantages and disadvantages of the material, the manner in which the latter can be overcome, and some tests to apply to determine the suitability of any sample piece of material. The advantages comprise firstly cheapness, the cost of material for any one appliance being negligible, secondly, its unobtrusive colour when brightly polished, in every respect equal to the most expensive platinised alloys; thirdly, its enormous strength, and fourthly its ideal springiness or "Biological



Efficiency," as the Germans call it, provided the material is correctly prepared.

The main disadvantage is the impossibility of hard soldering without loss of temper, this latter, as I have said, being produced entirely by cold working, coupled with the corrosion and discoloration which occurs when such joints are subjected to mouth conditions for any prolonged period. This difficulty seems insuperable, as even spot welding tends to produce a softened joint, with a diminution of the yield point from 30 to 20 tons per square inch.

Attachments normally soldered to the arch wire can however, be copied by correct manipulation of the material, some examples of which I bring to your notice to-night, whilst the German school adopts a compound method of attachment, using precious metal springs gold soldered to a nickel silver base which is then fixed to the arch wire with a low fusing solder.

The second difficulty is the occurrence of spontaneous fracture after the appliance has been in use for some while, this trouble being most frequently met with in the early days, but which we now know to be due to over manipulation of the metal resulting in surface bruising ; one pair of pliers only, should be used for gripping the wire, the actual manipulation being done by hand so that all surface bruises and scratches are as far as possible avoided. Here I have some specimen wires which have broken down for this reason, and some examples of the after effects of hard soldering.

As illustrative of the peculiar qualities of this material, I should like to bring to your notice some examples of my own fixed appliance technique, in all of which soldered joints are avoided without detriment to the potentialities either of the system or of the material. Finger springs can be easily arranged whilst various locking devices can be rapidly prepared ; the type I employ is quite distinct from the German pattern which to my mind is bulkier and less rigid, but here again is ample opportunity for the exploitation of ingenuity and of individual tastes. The material is of course equally suited for removable appliance work in which the arch forms are usually much less complicated, whilst the vulcanisation process has no deleterious effect on its working qualities, but here again care must be taken to avoid surface bruising of the material, otherwise spontaneous fracture may occur after the appliance has been some time in the mouth. Since the utility of the material depends in some measure upon an absolute constancy of its working qualities, not always easy for cold processed metals, a set of tests have been compiled to determine the goodness of a sample. Firstly, springiness, and of this I employ a purely arbitrary test which is the complete recovery of a two-inch piece of .8 mm. thick round wire, when bent at its extremity one half an inch below its plane of attachment. Secondly, an absolute test, which is the bending of a round specimen of the wire completely double when there should be no surface breaking of the material. Thirdly, another absolute test which is that fracture of this doubled over specimen should not occur until the doubled over limb has been unbent to about an angle of thirty degrees. Fourthly, is the simple test of vulcanisation of a sample and prolonged exposure to mouth conditions.



Pliers employed in manipulation can be of the most simple type, those I chiefly employ being the snipe fine nose pliers and the  $\frac{1}{8}$  beak blunt nose pliers ; a groove can be cut across the jaws of these pliers at a convenient width to facilitate doubling the wire flat for the lock attachment, the width of the groove being utilised for maintaining a constant length for the lock piece.

Convenient gauges to employ are : .6 mm. (.023 inch) for light fixed appliance work and for finger springs on removable apparatus, .7 mm. (.028 inch) for fixed appliances generally, .8 mm. (.031 inch) for general removable appliance work, whilst 1.8 mm. (.07 inch) is useful for lingual bar appliances of Jackson type.

As there must be many here who have had experience of the Continental product, it would be interesting to have the views of members as to its possibilities ; to my mind it marks one of the greatest advances of modern orthodontic technique and makes fixed appliance work possible for those who previously have in some measure been deterred by the relatively high cost of materials. In conclusion, I might add that this new preparation is the product of Messrs. Bawn, of East India Dock Road, who are noted metal workers and steel welders, and that Messrs. Dental Requisites, of 20, Newman Street, W.1, have kindly agreed to act as their agents, whilst it may interest the meeting to know that Mr. Watkin, one of our senior members, has kindly consented to demonstrate the fabrication of stainless steel material generally at the May meeting so that members will have every opportunity of examining this latest contribution which metallurgical science has made to the practice of our speciality.

#### DISCUSSION.

Mr. BULLEID, in opening the discussion on Mr. Cutler's communication, said he did not know that he could speak with any authority on the use of stainless steel, but he had had some little experience with Firth's "Staybrite." The product which he had been using was prepared by a firm called Hemmings & Sons—he thought of Sheffield—who would draw the wire down to any gauge that was desired. The point which had struck him most in Mr. Cutler's remarks that evening had been the suggestion that one very easily ruined the temper in soldering. Personally he could not say that that was his experience, provided the correct solder was used, and he had had the correct solder recommended to him by Firth's. For the moment he had forgotten the name of the makers, but he would be happy to furnish it to Mr. Cutler. It was a low-temperature silver solder, almost a gold colour in appearance. The joint was extremely strong, and provided one did not over-heat the joint the temper was not injured, especially if one did not plunge the joint after soldering. If a practitioner wanted to soften Firth's "Staybrite" he should heat it to a cherry-red and plunge it, when it immediately became quite soft. It would at once recover its temper if it were worked. He had also been experimenting with the use of band material in Firth's "Staybrite." That again was rolled out by a firm whose name he had forgotten for the moment but which he would supply. That firm rolled the material down to any fineness and width desired. He was at present using .003 + .006. It was immensely strong and quite easily soldered, and if quenched it became sufficiently malleable to burnish to the crown of the tooth. At any rate that was his experience. The attachments were also very easily soldered. The one difficulty with Firth's "Staybrite" was the tendency for it to blacken or to get covered with black oxide if over-heated. The firm in question provided a bath for removing the scale, but it would not remove the oxide. His experience was that it could quite easily be polished away by use of a soft brush and whiting. He did not think that was a practical difficulty at all. He was not



quite sure that in all mouths Firth's "Staybrite" maintained its silver appearance. In some mouths it appeared to get slightly greyish, but that also was quite easily polished away. Personally he was inclined so far to regard Firth's "Staybrite" as an excellent material for their purposes, and it had the overwhelming advantage of being extremely cheap. One could buy half a mile of it from Hemmings for about 4s., and it would last one for a lifetime. He thought Mr. Cutler would find that if he went on with his experiments on Firth's "Staybrite" it would turn out better than the German product. He would add that Firth's were only too willing to give any advice or help or information about the workings of the metal, or the pickling, or the strengths, and if they could not do so themselves they would inform one to which firm to go. He would be pleased to supply Mr. Cutler with the names of these firms.

(It should be added here that Mr. Bulleid's promise to give to the Society the names of the various firms who supplied the different types of stainless steel at the next meeting was fulfilled, and is as follows). With regard to the "Staybrite" wire and spring-tempered wire, Hemmings & Co. of Valley Works, Grange Lane, near Rotherham, would draw any gauge of "Staybrite" steel wire which a member specified. With regard to the bath used for pickling the stainless steel, the ferroclenol, which was made up with hydrochloric and nitric acid, was supplied by a firm named Proderight, Eagle Works, Wednesbury, Staffordshire. A firm which would draw strip stainless steel to any width or gauge desired was Samuel Fox & Co., Ltd., Stockbridge Works, near Sheffield, and the firm which specialised in silver soldering was the Sheffield Smelting Co., Ltd., 95, Arundel Street, Sheffield. These firms would supply all that orthodontists required in the way of staybright stainless steel, and would be only too pleased to give any help in the matter.

At the last meeting one member had said that "Staybrite" steel could not be soft soldered. This, however, was perfectly easy. It was necessary that the surfaces should be absolutely clean. The correct flux was a saturated solution of zinc chloride in 50 per cent. hydrochloric acid. The soldering could be done with an ordinary copper bit or with a blowpipe, whichever was preferred. With regard to silver soldering, he saw no difficulty if the correct flux was employed. It was necessary not to get the temperature too high, and the flux must be used very freely. The whole surface to be soldered must be entirely covered with the flux, and no higher temperature used than that necessary to melt the solder. Mr. Bulleid passed round a few specimens in further explanation of his point.

Mr. PACKHAM thanked Mr. Cutler for his communication, and asked him kindly to elaborate the technique of embedding this new stainless steel in vulcanite, and to say whether it was necessary, as in the old days when pianoforte wire had been used, to tin the steel wire before embedding it in the actual vulcanite material.

Mr. WATKIN also extended his thanks to Mr. Cutler for his communication, which ought to be published and illustrated in the *Transactions* as soon as possible. Up to the present he personally had experimented only with Wipla steel, and he was glad to know that practitioners could now get an English product just as good. With regard to finger springs, he had got over all the difficulty of fastening finger springs to the main bow without any loss of temper; .5 mm. was used for the finger springs and .7 mm. for the ordinary bow wire. One bound the finger spring to the bow wire with a fine tinned-copper wire, gauge about 38 and soldered together with soft solder, using zinc chloride as a flux at a very low temperature, and there was no loss of temper. If the bow wire and the finger spring wire were both slightly roughened, by squeezing with a pair of pliers at the point underneath the binding it was impossible to dislodge the joint. He would give full details at the demonstration meeting in May. One could use finger springs on stainless steel with the same facility as one could use the more expensive gold metals.

Mr. AINSWORTH asked if it was true of stainless steels that they were only stainless when they were highly polished.

Mr. CUTLER, in reply, said with regard to the point which Mr. Bulleid had raised, that if the wire were heated to any appreciable degree at all, blackening occurred, which could be removed to a certain extent by descaling and could be



completely removed by polishing ; but the wire would blacken again, as would be seen from the examples which he had handed round that evening. That was a difficulty which he had not got over, although possibly Mr. Bulleid might have done so. He had found that any appreciable temperature would cause some oxidation of the "Staybrite." "Staybrite" was the trade name for the Austenitic type, nickel-chrome alloy. The other form—the Martensitic type—was no use at all, and he had found that if that was subjected to any temperature worth mentioning, discoloration eventually occurred, although the material had been brightly polished. Then the point arose about getting the temper back again by working the material. That could be done, but it had to be remembered that the beautiful resilience and elasticity which was in the wire when it first came to hand had been brought about by continued passage through very big wire-drawing machines ; and that by manipulation and bending about the wire here and there, nothing like the original strength and elasticity could be obtained, so that the point at which there was a hard soldered joint (however much it might have been manipulated) would be a relatively weak point in the arch wire. Therefore any alterations in the form of the arch wire which might be done subsequently would always make it bend unequally at that point. Moreover, it was advisable to try to get the arch wire passive and lying perfectly freely and easily before putting on the subsidiary attachments, and if after two or three finger springs had been put on and the metal was worked at those points, the original fit of the presumably passive arch wire would be upset entirely. Those were difficulties which he still experienced in connection with the question of soldering.

The point which Mr. Visick had raised was a good one—that as far as band material was concerned it did not matter whether the temper was lost, or if there was a certain small measure of discoloration. He thought Mr. Visick had raised an extremely important point. He had not used the band material, but he would take the first opportunity of doing so. So far as the arch wire was concerned, he felt that the points he had raised still held good.

Mr. Packham had raised an important point in regard to embedding the vulcanite, because with nickel-silver, for instance, if a simple retaining wire made of nickel-silver were used there was hardly any need to make any re-entering curves at all to embed it in the vulcanite. It was almost impossible to pull the wire out of a piece of vulcanite, even if the embedded piece was quite straight. But with Firth's "Staybrite" there was so little change during the process of oxidation that there was no sort of surface adhesion whatsoever on the part of the vulcanite, and unless the tag which was kept in the vulcanite was twisted round several times it would pull out or turn round and become loose. When it was used for removable appliance work it was necessary to make several re-entering bands for the vulcanite to grip in firmly.

Mr. Watkin had brought up a point about the ability of soft soldering material. It was really a development of what he (Mr. Cutler) had illustrated on one of the charts. It was similar to the work of the German school—a sort of compound method of attachment.

He had been quite unable to get any form of soft solder, either pure tin or ordinary tin solder or any of the preparatory mixtures, which was satisfactory. He had been unable to get any true adhesion to the surface of the stainless steel using any flux like zinc chloride or Fluxite. A sort of mass fixation could be obtained by putting a mass of the material round the piece of wire so that it embraced it very fondly, but that could always be displaced ; and when it was displaced it was evident that there was absolutely no adhesion whatever. He was extremely interested to find that Mr. Watkin could actually get a real true union of some form of soft solder with the material.

The question as to whether the material was stainless only when it was highly polished had been raised. That might be true of the Martensitic type, but the nickel-chrome "Staybrite" alloy was stainless whether it was polished or not. It was completely resistant to corrosion. The Martensitic type, the chromium carbon alloy, was liable to discolorisation he believed unless it had been worked and polished. That was not true of the Austenitic type. He quite agreed that in some mouths there was a certain amount of deposition of greyness, but it polished off at once.



AN ordinary meeting of the Society was held at the Institute of Hygiene, 28, Portland Place, W.1, on Monday, February 1st, 1932, Mr. CARL SCHELLING, President, in the chair.

The minutes of the previous meeting were confirmed, and the candidates for election, namely, Mr. A. Gordon Taylor, L.D.S., R.C.S. (Sutton-in-Ashfield), and Mr. H. W. F. Freeth, M.R.C.S., L.R.C.P., L.D.S. (Grosvenor Square, W.), were elected members of the Society. Mr. Freeth was present and was welcomed by the President.

Mr. A. L. PACKHAM read a paper, "A CASE OF TREATMENT BY EXTRACTION OF TEETH."

Mr. G. F. CALE MATTHEWS, before reading his paper, "THE B.S.S.O. : ITS WORKING AND UTILITY," said that he had filled a gap that evening caused by the serious illness of Mr. George Campion, who was to have addressed the Society. He would like the meeting to send a message of sympathy to Mr. Campion in his illness.

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### A CASE OF TREATMENT BY EXTRACTION OF TEETH.

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MR. A. L. PACKHAM made a short communication on this subject, illustrated by the epidiascope. He said that the treatment of orthodontic cases by extraction of teeth had always been, in his hands, rather a harassing procedure, in that he was never quite sure what was going to happen. The present case illustrated to a certain extent that point. The case was that of a girl, now aged 16½. The first photograph was taken in September, 1924, when she was 9½ years old. He drew attention to the good general skeletal development, also the excellent facial development, the molar width, and the good development of the nose. Another photograph showed the well developed mandible. There was crowding in the anterior region of the upper jaw. The left upper lateral was well inside the arch. Both arches showed crowding. The appearance was bad, and obviously the case demanded treatment at once. A diagnosis was made of deficient bone growth in the upper and the lower jaw, but more marked in the upper than in the lower. Expansion of the arches was scarcely possible or feasible owing to the degree of crowding, and so a policy of reduction in the number of teeth in the arch was decided upon, and the temporary canines were removed at once.

Mr. Packham next showed a model illustrating the condition four months after the removal of the temporary canines. The laterals had come forward and over the bite, with no treatment whatever, and were almost in line. His next model showed the condition after the first premolars had been extracted, when the central inclination had almost cured itself, again without orthodontic treatment. There was no change to record in the lower jaw. A further model showed the canines coming quite regularly into position, and yet another model illustrated the condition to-day, which was compared with the first models. There was now almost perfect alignment, six and a half years after the temporary canines were taken out. The measurement taken from the pit of the first molar to the cutting edge of the incisor was less in the later model than it was in the first model by as much as 3 mm. The molar occlusion apparently was not altered, so that one could assume fairly accurately that these teeth had moved back 2 mm. He was



quite sure that there was a difference of 2 mm. The upper incisor teeth were now edge to edge.

He showed some recent photographs of the girl, and indicated the difference in appearance in the upper lip. The flattening of the upper lip just underneath the nostrils rather accentuated the already prominent chin, and to some degree destroyed the beauty of the face. The line of the upper lip fell on a surface more posterior than the normal line of the lip. The incisors were edge to edge, and the molar bite was still flush.

He added that the uncertainty of the results of treatment by extraction was the point that he wished to bring out, because he would never have foretold that the upper incisors in this case would move back to the extent they had done, thus giving rise to a considerable change in the facial expression of the child as demonstrated by the models and photographs exhibited.

#### DISCUSSION.

Mr. HAYTON WILLIAMS said that on looking at Mr. Packham's models he derived the impression that the lower incisors had gone forward to give the edge to edge bite with the upper incisors, and not that the upper incisors had gone back, but in that respect he might be wrong. The lower part seemed to be very much expanded, and he presumed no treatment was undertaken. The fanning of the incisors seemed to have pushed them all forward.

Mr. GEORGE NORTHCROFT thought that Mr. Packham was to be congratulated on the careful presentation of this case, which included many points of great interest. Mr. Packham had not mentioned the change in the child's nose from its appearance at the age of 9 as compared with the age of 16, and for such a change the most conscientious orthodontist would not consider himself responsible. Some of the appearance of the backward position of the upper lip was probably brought about by the greater growth forward of the nose; the nose certainly had coarsened very much in shape. He wished Mr. Packham would, if possible, give the reason why he had abandoned or dismissed the idea of treatment without extraction in this case. The term "flush occlusion" seemed unfortunate; so-called "flush" occlusion, a term which he believed was introduced by Sir Frank Colyer, dated from a time before the condition of post-normal occlusion was so well recognised. The condition was really post-normal, and he thought Mr. Packham's case should be considered one of Angle's Class II, Division 2.

Mr. HAROLD CHAPMAN said that he felt with Mr. Northcroft that this must be a Class II, Division 2 case, though perhaps of rather an unusual type; the upper incisors were lingually placed instead of being buccal to the central incisors, as is usual in these cases. He was surprised to see that the result of the treatment was that the upper and lower incisors had become edge to edge, but he could not conceive how the upper incisors had gone backwards, as Mr. Packham suggested, and yet it was unusual that the lower incisors, which in this case meant the whole lower arch, had come forward. It seemed to him that this was as near a Class I case as a Class II. It appeared, from an examination of the models, very slightly post-normal, and he was inclined to think that the lower jaw was growing forward abnormally; he had seen one or two such instances. As far as the alignment of teeth in the upper arch was concerned, it could not be better, and he congratulated Mr. Packham on the result. If the lower jaw were coming forward, it is doubtful if the orthodontist could prevent it, at any rate permanently. It was a most interesting case, and he hoped Mr. Packham would show it again in two or three years' time, when he believed it would be found that the mandible, and with it the lower arch, had moved forward still further.

Mr. PACKHAM, in replying on the discussion, said that, with regard to the point raised by Mr. Hayton Williams, he could only express his opinion that the upper central incisors and laterals and canines had all moved back. He did not think the lower teeth had come forward, although Mr. Williams had brought forward



a point which he himself had meant to bring forward, that if the inclination of the lower incisor teeth in the first model were compared with the inclination in the last model, it would be seen that they were fan-shaped in the first model, while in the last, which illustrated the position as it was to-day, without any treatment at all, they had all assumed a perfectly vertical position. Yet, despite this, by measurements which he admitted were not absolutely scientifically accurate, yet were good enough for most of them in their daily work, a backward movement of the central incisors of at least 2 mm. had really occurred.

With regard to Mr. Northcroft's point, the reason for deciding upon the reduction of the number of teeth in this case was because he thought there was no chance whatever by expansion of getting the teeth into alignment. He fully accepted Mr. Northcroft's kind rebuke about the use of the term "flush occlusion." He himself disliked the term, because, for one thing, it was not decided enough, and if he were dealing with such a case now from the beginning he would use the term "post-normality." He thought there was no question that there was some degree of post-normality of the mandible. Yet he drew attention to the chin and the lower jaw—it was almost a "boxer's jaw." He could only say that six years ago he was more ignorant by six years than was the case to-day. He thanked those members who had taken part in the discussion for their helpful remarks.

## **THE B.S.S.O.: ITS WORKING AND UTILITY.**

### **A Suggestion for Help for the Newly Qualified Practitioner.**

By G. F. CALE MATTHEWS, L.D.S.Eng., B.D.S.Birm.

ON 21st October, 1907, twelve dental surgeons met at 115, Harley Street at the invitation of Mr. George Northcroft to consider the formation of a society to study the practice of orthodontics. Out of that meeting, through the enthusiasm of its originators, the British Society has grown to its present dimensions. At that time the influence of Angle had dominated orthodontic thought throughout the world, but there was growing up in the minds of practitioners an idea that all was not well with an absolute and definitely systematised method of treatment such as was advocated by Angle; and investigations into his many statements were being carried on in various countries. It was the desire of these original members to study the subject of orthodontics and place before the dental profession something scientific and more in keeping with scientific progress, which would be more truly useful to the great body of practitioners, than the methods so far advocated by Angle. Up to this time the practice of orthodontics had been very elementary. There had been no combined effort to get to any fundamental facts, and the position was more or less chaotic. It is obvious that during the intervening years from 1907 to 1931 advance in the science and practice of orthodontics has progressed more rapidly, possibly, than any branch of dental surgery. This is evidenced by the growth of the British Society, which was by this time able to act as the host of the Second International Orthodontic Congress, held in London in July of last year.

May I digress for a moment, and examine the position of the training of our students, and the knowledge acquired by them up to the time they take their final examination for their Diploma, and the



provision given for their training in orthodontics. No adequate time is allowed in the curriculum of any of the licensing bodies for a serious study of such an important subject. The whole of the curricula are overloaded with subjects, some of them foreign and of little value in a practical sense to the dental surgeon, apart from the fact that knowledge of any sort must be of value to its possessor. As one who has endeavoured for over twenty years to impart some slight knowledge to the young mind in this subject, I feel I am justified in saying that our possibilities of teaching orthodontics in this country are very elementary under present regulations. What can be done about it? Efforts at various times have been made by the different schools to give special post-graduate courses to those interested. Whatever enthusiasm has been evinced at the start, it has generally fizzled out before the end of the course. This must be so as it is primarily a matter of economics. A man in practice cannot afford to spare time to attend a long and serious course of special work which involves considerable financial loss. Is there any way in which the B.S.S.O. can assist the earnest enquirer, and the very young practitioner in this subject?

The extraordinary access of membership during the past few years to the ranks of the B.S.S.O. unquestionably points to an earnest desire to acquire information, and it must be obvious to anyone interested, that the programmes through the years have been mainly of an academic type. Once a year an evening is devoted to the practical side of the subject and a series of demonstrations are arranged, from which a member is supposed to gain all the information the demonstrator may have to impart in ten minutes. It is obviously an impossibility. We have not awakened to the desirability of specialisation, and it will be some considerable time in all probability before specialisation in orthodontics to any extent will take place in dental practice. This may be due to our peculiar national conservatism, and to other factors such as scholastic and geographical difficulties. I am not desirous of emphasising the advantages of specialist practice, but I do feel that the young practitioner to-day is so slightly equipped in this subject that once qualified he has few possibilities of acquiring clinical experience unless he is associated with someone who is in earnest orthodontic practice, or he is on the staff of a school where some effort is being made to teach this subject. As an instance of this, one of our foremost orthodontists told me a short time ago that his students were never allowed, in their pre-graduate days, to treat cases, and the utmost they were allowed to do was to place a separating wire; that all the treatment and all the work was done by himself and his qualified assistant. And another eminent orthodontist told me he had long since given up the idea of training students in this complicated subject and endeavoured only to give them an all-round theoretical knowledge of the subject with a slight practical course.

Personally, I disagree entirely with the attitude of both these men. At the same time I recognise that they have come to these conclusions, mainly owing to the extreme difficulty of being able to give the necessary time involved in the teaching of large classes of students, where it is obvious that there must be a more or less individual contact between the teacher and his student.



Again, I imagine myself just qualified with a desire to do serious orthodontic work. What am I to do? Where am I to gain experience? If I can afford to give one or two years to a course in the United States, I shall have gained much, but I may be required to take a degree and subsequently a special course involving more time. This is not possible for many. Why if these things are obtainable in other countries are they not obtainable here? Why do we accept the position? Whose fault is it? How many dentists in England would have the courage to say, "I cannot do this work?" What is frequently said is that, "It does not appeal to me." "I do not believe it is a sound practice. I believe it is wiser and better to leave things to Nature after the case is relieved by extraction," and so the public is misled into thinking the foreign dentist is so much more able.

We know that our general training is second to none—the demands of every licensing body are higher than those of any other country—but there is no room for frills and so far any specialised teaching has been and must be outside the curriculum. Even those bodies granting degrees have not given very definite help to their examiners regarding the scope of the examination; true they know the examination is to be of a high standard, that no limitation is to be placed on the questions, etc., but in such a subject as this it would be of advantage if one could test a man's work by results and then apply practical tests in the higher examinations. It is difficult to deal with such a subject as this without encroaching on the personal and that is the last thing to be done, but while it is generally acknowledged that orthodontic treatment is necessary for the children there is yet little evidence of those in authority considering the subject from our practical point of view.

The attendance at the Congress of English Dentists was disappointing, only 33 per cent. of the members of the B.S.S.O. registered. This may be an argument against my suggestion, as showing there is no demand for further education, and that any man desirous of obtaining practice or help must work out his own salvation.

This Society stands for British Orthodontic practice, it is universally recognised to be a learned Society; although I notice it is not recorded in the list of such in any publication. It has a record of valuable work behind it, its future is assured; but can its sphere of usefulness be extended to those who are coming along, before so many with so much experience and skill have passed to the great beyond, taking with them knowledge which cannot be imparted in the writing of papers.

The last paper that I heard at the Society was read by Sir Norman Bennett on the "Psychology of Orthodontic Treatment." It was interesting, amusing and informative, and the discussion which arose interested me extremely, mainly from the fact that the speakers debated the relative values of fixed and removable appliances, more particularly the value of inclined planes on removable appliances as against intermaxillary traction with a fixed appliance, and as the discussion proceeded, it seemed to me that the younger men present at the meeting must be more and more confused as to the meaning which the speakers desired to impart in their discussion. It could only be assumed that the audience must be conversant with the values of the methods advo-



cated by different individuals, but at no time during the discussion, if my memory serves me correctly, was there any effort on the part of an individual speaker to show the various actions of forces, the various applications of these two methods, the relation of forces both active and passive, methods of construction, or the ideals to be aimed at ; but an assumption that given a certain appliance the case was automatically corrected ; and it was a matter of pure choice as to which method was employed. Anyone with experience of clinical work knows that there is a far deeper and complicated basis of treatment behind the application of any force. For instance, in this particular type of treatment and case, there was no indication given as to a sequence of variations in the appliance, and one speaker went so far as to say that at his hospital a type of appliance was used which never failed, and under its influence no case could possibly revert.

The discussions at so many of our meetings have taken on the high-brow plane involving complications of theories, and so little of real practical help to the majority. Not for one moment should I wish you to infer that this is due to the ideals set up by the founders of the Society, or by the Society itself. It is no exaggeration to say that the papers read before this Society have been of a high standard, have opened up ground hitherto unexplored, and brought into the orthodontic world men of eminence in anatomy, physiology, physics and kindred subjects, whose work will probably live for all time. So really what I want to ask to-night is whether it is possible for the B.S.S.O. to initiate and inaugurate any series of classes, or clinics, or what you like to call them, whereby the enthusiastic general practitioner can acquire a technical knowledge and a clinical experience of the work of others and thereby enable him to approach his cases from a little wider point of view than that laid down by the text-book.

A questionnaire issued by Dr. Guy on behalf of the F.D.I. on Orthodontic Education, etc., cited four replies, that I imagine was the result, as only four replies were published in the B. D. Journal. They represented France, England, Holland and America, as indicated by nationality only, and were personal opinions. What seems so contradictory to me is that despite the enthusiasm evoked at these meetings, there is no consequent effort to advance the teaching or practice during studentship. Text-books are essential and valuable, but it is the personal touch, the "something" which the practitioner of experience cannot give in a paper, but which he does unconsciously in the course of his treatments, which can be so useful to an observer.

During my efforts to gather information for a Report on Diagnosis for the Congress in Paris last year (1931), I waded through all the Journals, text-books, etc., published during the past twenty years. I found nothing of value on purely diagnostic grounds alone. Almost all the papers on Diagnosis were allied to treatment, and from that I infer that visualisation of a deformity immediately suggested a method of treatment for its correction, and further I infer that this has come through Angle's teaching, for with diagnosis came automatically his especial method of correction. Thus I think our thought and teaching have become somewhat mechanical. The great interest in the demonstrations at the Congress in July was sufficient evidence of anxiety to learn.



But orthodontic practice does not entirely lie in the construction of an appliance, and I would caution my young friends that those demonstrators have not arrived at the point of perfection either in their mechanics or treatment, without much study, and many heart-breaks and disappointments ; yet I find so many whose whole anxiety is to be put *au fait* with an appliance—not realising that the initiation of a treatment may be by far the easiest stage, and that it is only by a wide experience that the wonderful results there shown were obtained.

Possibly in no branch of dental practice is dogmatism more distinctly marked than in orthodontics ; the extraordinary enthusiasms for individual methods of treatment by particular types of appliances carries men beyond the knowledge and experience of their fellows in general practice, and it is a revelation to spend time at the chair-side of experienced orthodontists, to watch them working under any method which they may have established as their routine, which any man aspiring to orthodontic practice should endeavour to acquire.

In his summary of the last International Orthodontic Congress, Dr. Waugh puts the matter very clearly. He summarises his opinion of the Congress thus :—

“ Knowledge in the fundamental sciences has been more valued and sought abroad.

Teachers in the fundamental sciences abroad have been interested for a longer time in orthodontic problems and are, therefore, better informed on special orthodontic needs and applications in their particular branches.

Orthodontic education seems to be practically a minus quantity abroad. I regret to have to make this comment, but it is based on my inability to learn of any school where it was being seriously taught, and to the lack of discussion given by our colleagues residing abroad to the papers on education.

Scientific knowledge does not seem to be well applied to practice by the orthodontist abroad. He has an urge for research, but has not produced much of practical value and does not seem to apply what he has learned. This is probably due largely to lack of exclusive specialisation ; therefore, there is less concentration in practice.

Biometrics, gnathostatics, and cephalometric methods are more used abroad, especially on the Continent.

The advantages of exclusive specialisation were more firmly impressed upon me than ever, as nowhere has orthodontic service reached the development that it has in the United States, as attested by the quality of treatment given the patient.

We must, however, appreciate the benefit of knowledge in the fundamental sciences and work zealously for improvement, since our real solution of the problem that daily confronts us must be largely solved by this means. To this end we must as a body embrace every opportunity to interest researchers and those who support them in the solution of the problems confronting orthodontia.

We should work more closely with our colleagues from abroad, as they have much to give us, and I hope that we, of America, shall have some information of importance to give in return.



In closing, may I express the hope that my comments may offer offence to no one. They are, after all, the opinion of only one observer, and as I said in the beginning, "no two persons would be impressed with the importance of the same things."

I think many of us will be quite in agreement with Dr. Waugh, and I think that many of the differences that he points out are perhaps due to a national characteristic. As a nation we have developed a theory of compromise, and I think that is what is happening in orthodontic practice to-day. We are not, as a body, endeavouring to establish a perfect occluding denture out of chaos, so much as giving an efficient and fairly symmetrical denture, and until we have made up our minds on which of the ways we are going to travel as a profession, matters will remain very much as they are. The B.S.S.O. appointed committees some few years ago, one on nomenclature and one on education. As far as the memorandum on education which is of extraordinary value, involving a tremendous amount of work, I do not think much of it has been adopted in any of our teaching schools. As regards nomenclature, almost every speaker before this meeting still uses Angle's classification, despite the obviously more correct scientific value of the Committee's report.

It is for the younger men of the Society to say what they want, if they do want it, and it may be that I am beating the air in advancing anything which I regard may be for their help in the near future, but it seems to me a great pity that in a Society such as this, where there are many whose experience should be of infinite value to their colleagues and the community, that they have no possibility of imparting knowledge other than the very casual manner possible in the discussion of a paper. The course initiated by the Dental Board, and undertaken by Mr. Harold Chapman, I have no knowledge of its successes or the enthusiasm with which it was taken up, but it does seem to me that if anything is worth doing, it is worth doing to the advantage of the greatest number. In that respect there is an extraordinary inequality which is inherent in human nature, but that inequality could be largely reduced if sufficient enthusiasm—both of those with the knowledge and experience, and of those desirous of gaining knowledge—was aroused, if they could come together in systematic courses which would be to the benefit of themselves and to the benefit of the children of the country.

It is so obvious to me that the extraordinary amount of experience possessed by many members of this Society cannot be made available to those yearning to possess it, under present conditions. That in the inevitableness of things, that knowledge and experience must pass away unless some effort is made to pass it on.

#### DISCUSSION.

The PRESIDENT said that the author had mentioned Mr. Campion's unfortunate illness which had prevented him fulfilling his part in that night's programme. The Hon. Secretary had already written to Mr. Campion expressing the Society's regret, but he was sure all those present would support him when he said that if Mr. Cale Matthews would kindly write and express the sympathy of those gathered at that meeting it would be in accordance with their wishes.



With regard to the general questions brought forward by Mr. Cale Matthews, one point not often mentioned in connection with orthodontic cases turned largely upon economics. Dentists who lived near a large school and were in the good graces of the school officials, naturally got a good deal of work to do. When he himself was a young practitioner at Blackheath he was in the neighbourhood of a large school, attended by day scholars, and between 12.30 and 1.30 he would often see a dozen children for slight adjustments. But in the part of the world where he was at present, the West End of London, most of his child patients went to fashionable boarding schools, where he was precluded from seeing them when he wanted to do so. The house masters objected, and, especially in the case of girls, the principals of schools said that their pupils ought to see the school dentist, and that was all there was about it. In those circumstances the school dentist had a constant succession of cases, and it was perhaps more convenient and less costly to send them to a dentist on the spot, who really became, from constant practice, a specialist, even though he might not call himself such. It was really better that it should be so, for the school dentist was likely to do a great deal of this particular form of work, and that was all to the good.

Mr. HAROLD CHAPMAN said that he thought the subject brought forward was one which would interest every member present, and therefore there was no necessity for him to speak, especially because what he had to say could only be a repetition of what he had said two months ago on the occasion of Sir Norman Bennett's paper. Mr. Chapman said that his own views with regard to the teaching of orthodontics were more or less definite. He thought that, in the first place, in relation to dentistry as a whole, orthodontics must take a secondary place. It was a part of the subject, and he did not see how one could possibly compare it with the whole. As a teacher in a school where dentistry was taught as a whole, he had to remember that orthodontics was only a part of the curriculum, and it seemed to him that orthodontic treatment had not the same value to the general public as the treatment of caries, for example. Therefore, so far as the schools went, orthodontics had to take its place among the subjects taught in accordance with its importance in the curriculum as laid down by the examining bodies. His own view was that all students should be taught the theory and the practice, so far as this could be done, in the course of lectures. It was well that they should have this course, even if afterwards they never practised orthodontics. They should also be required to do a certain amount of technique work, which in any event was very good training, and the two things combined should enable a man, in the usual run of cases, at any rate to give sound advice to the parents of children in the matter of orthodontics. He found that parents expected this from their own practitioners. They did not all want to have specialist opinions; they expected their dentist to be able to formulate opinions on orthodontic cases, and he thought it was up to the students to learn sufficient to be able to do so. He hoped that teaching and examining bodies would insist on candidates being able to deal with such problems. In addition, it might be said that certain men liked the practice of orthodontics, and others disliked it. Those preferences were quite discernible in the students themselves. Some of them were distinctly interested in this work; he thought that those who were should be allowed to treat cases, and that those who were not interested should not be forced to do so. To his mind that was a very satisfactory solution of the problem. The present curriculum was too crowded to enable the schools to turn out practitioners competent to handle any case, but the student should have the opportunity to do clinical work involving both fixed and removable appliances; in some schools this was compulsory, because the student had to act as a dresser in the orthodontic department for a certain period, a method which had distinct merits. The orthodontic course arranged by the Dental Board was open to fifteen students, but only nine applied. As to its success, he must leave others to speak, but it was quite clear to him that as there were only nine students, those nine as individuals must have derived more benefit from the course than fifteen could have done. The very fact, however, that only nine took the course seemed to point to the conclusion that there was not a very great demand for post-graduate education in this subject; the figures spoke for themselves. He thought the



Society was much indebted to Mr. Cale Matthews for having brought the subject forward.

Mr. CALE MATTHEWS explained that, in conversation with an eminent orthodontist, he had been told that the students of this gentleman were never allowed in their pre-graduate days to treat cases, all the treatment and work being done by himself and his qualified assistant, while another orthodontist had said that he had long since given up the idea of training students in this complicated subject, and endeavoured instead to give them an all-round theoretical knowledge with a slight practical course.

Mrs. LINDSAY said that the question of the education of orthodontists was bound up with that of the education of the student as a whole, and she thought the matter might be simplified by concentrating attention in the lectures on general anatomy, upon a much better training in anatomy of the head and neck. On looking through the examination papers for the Licentiate in Dental Surgery, one found that questions were asked on the thorax, the abdomen, and the upper and lower extremities, but questions on the head and neck were often neglected. She had a collection of such examination papers, and found that questions on the head and neck were rather rare. Mr. Steadman had opened her eyes to this by saying that when he was demonstrating local anæsthesia he found that he had to "spoon feed" the practitioners with regard to the anatomy of the mouth. The processes involved in the growth of the bones of the head and the oral cavity were practically unknown among dental students. That part of the curriculum was very much neglected. Certainly if one was going to be a dentist one ought to know the anatomy of one's part. Another thing which was neglected was the laws of physics which were encountered in the practice of orthodontics. Very few students were taught how to apply the information they acquired in the class of physics to their practical work. Sometimes they would try to separate a tooth in two directions; if properly trained in physics they would not do that. Practice in the dental laboratory, again, was very much neglected, and it was being curtailed more and more. Naturally an orthodontist wanted that training more than anything else. She thought that in such directions the education of the student should be concentrated, and then the speciality of orthodontics would come naturally to him afterwards. He would not dislike it so much if he were properly trained in the fundamentals.

Mr. W. A. BULLEID said that as he understood Mr. Cale Matthews's paper, he had been asking what the Society could do to further the teaching of orthodontics to those starting a professional career. That was rather a difficult question to pose before the Society, but it struck him that there were perhaps two ways in which the Society could take action. If it was to continue as a Society as at present it could do little more than it now did, namely, arrange for the reading of papers and the giving of demonstrations, and so forth. But as an organised body it might bring some influence to bear upon the examining bodies in the United Kingdom. If more was to be done he did not see how the Society could help very much unless it were definitely to turn itself into a post-graduate college for the teaching of orthodontics. Perhaps that was not altogether a wild and impossible dream. He did not see why the Society should not possess a laboratory and consulting-room, nor why the senior members of the Society should not bring patients there and treat them before the general body of members. It was quite possible and easy to get patients of the hospital class to attend, and the matter would not involve any large financial outlay, while it would certainly meet Mr. Cale Matthews's contention that a great deal of the knowledge possessed by senior members of the Society should not run to waste. He merely put that forward as a practical suggestion.

Mr. H. E. MARSH considered that this matter was very largely wrapped up in the question of supply and demand. During the past twenty-five years the rise of specialisation in orthodontics in the United States had been coincident with a great wave of prosperity in that country which more or less came to an end in 1927-28. Whether the specialists in orthodontics would subside with the wave of prosperity he did not know, but he thought they must all realise that the demand for orthodontic treatment by patients in this country was largely dependent upon the means which they possessed to secure first-class attention.



Should that demand become large, the supply of specialists in orthodontics would become large also. As far as the teaching in this country was concerned, he believed that it depended, as the teaching of all other sciences depended, on the character and attainment of those who held the office of teachers in the schools, and he thought they had no reason to be ashamed of those who held such positions in this country. Many of them were men of world-wide reputation, and their contributions to orthodontic science had been very great. Personally he did not think the time had yet arrived when a school for orthodontic specialisation could be properly founded in this country, but it might come in the future.

Mr. J. STURROCK said that Mr. Chapman's class seemed to have supplied very much what Mr. Cale Matthews had outlined, and he was surprised to learn that only nine students took advantage of it.

Mr. A. T. PIRTS said that as a teacher and examiner he was extremely interested in orthodontic education. With regard to the comparison between the education of students in orthodontics in this country and in the States, it seemed to him rather doubtful if there was any great difference. In America nearly all those who practised orthodontics were specialists, whereas in this country it was part of general dental practice. Therefore the fact that there was no very thorough education of the students in orthodontics in America did not matter very much, because, if the student desired to specialise, there were many opportunities for post-graduate instruction through the private or quasi-private schools. In this country, on the other hand, if a man wished to become proficient in orthodontics after qualifying, it was a difficult matter. He considered that it was impossible to go very far into the subject with students. When the size of the dental curriculum was considered, it was apparent that it was not possible to give any longer time to orthodontics. Even if some parts of the curriculum could be cut down, he doubted whether much more time could be spared for orthodontic teaching. It was not possible to do much more than to draw the student's attention to the outlines of the subject. He had found that students seemed to be quite keen on listening to such instruction as he could give them. He limited himself almost entirely to the clinical aspects. Some years ago an attempt was made to discover whether a body of orthodontists willing to give post-graduate instruction could be established. Some of them met together and discussed the project, but they found that there were a great many difficulties in the way of establishing a sort of semi-public post-graduate school such as those which existed in America. A good deal of capital would be needed. The place where the school should be held was by no means an easy matter to decide. Then, again, there was the economic side of the question. Those who had to do with teaching knew that, however much they might gain from teaching in the shape of stimulus through meeting students anxious to learn, teaching had little financial recompense. In time, no doubt, post-graduate instruction in orthodontics might be an adequately paying proposition, but for some years to come teachers would have to be prepared to give a great deal of time for little or no reward, until the desire for post-graduate instruction had been stimulated and the post-graduate habit formed in the same way as it existed in medicine. He still felt that something of that kind was possible, for the fringe of post-graduate teaching had scarcely been touched by the hospitals. It would be rather difficult for the Society to turn itself into a post-graduate teaching body, as Mr. Bulleid had suggested. Who would undertake the invidious task of picking out those members of the Society who were the right persons to give the teaching to others? There was one useful thing which it seemed to him could be done. Many men were interested in orthodontics. They had some ideas on the subject, and would be prepared to do careful work. They had perforce to be satisfied with the "monstrosities" that so many mechanics sent up from the workshop and called a regulation plate. But they did not know what materials to use and where the desired materials could be obtained. They did not know what sort of wires to use, or what kind of gauges. Earlier that evening Mr. Bulleid had given some valuable information as to where stainless steel could be obtained. All such information was very valuable, and might be formed into a catalogue of orthodontic appliances. Information as to the raw materials which was not afforded by any textbook, and which, although familiar enough to those doing a



good deal of orthodontic work, was really unknown to the general dental practitioner, might very well be published by the Society. The very fact that it was unknown to the general dental practitioner made that practitioner chary of attempting the better kind of orthodontic work.

The PRESIDENT, in closing the discussion, said that he had been very often called in consultation with other practitioners, but he could not say that he had ever noticed any lack of knowledge in his contemporaries in this country! One point to bear in mind was that orthodontic cases were always urgent. The continual oversight of them naturally fell into the hands of those who lived near the big residential schools. A speaker not long ago at a dental meeting had mentioned three cases. One was the case of a boy who had turned his gold plate into pelf and spent the pocket money; another a girl who lost her plate when sea-bathing, and a boy who had washed his plate when a dog seized it. All these had to be replaced, and such work should be done promptly.

Mr. CALE MATTHEWS said that he was extremely pleased that the few remarks which he had made had brought forth such an interesting discussion. He was not finding fault so much with the teaching given in the schools, but rather with the opportunities given to the teachers in the schools. The President, in his opening remarks, had clearly misunderstood him, because it was not a question of the number of children whom one saw; no one doubted that there were myriads of children who needed the services of the orthodontist. What he appealed for—unfortunately that evening the audience was not as representative as usual of the younger members—was the young man who had no opportunity, having qualified or graduated, of carrying on his orthodontic work, if he had a flair that way, except in his private practice. He held no brief for the methods of running commercial institutions. What he wished to bring out was that in the Society there were men of great experience, many of whom were teachers to-day or had been teachers in the past. They could write papers for the Society, many of them had published articles, they had given lectures under the auspices of the Dental Board and the like, but they would pardon him, he knew, when he said that all these papers and lectures were of little value to the practising orthodontist. It was an academic attitude which had to be chosen and written upon. But what was particularly needed was that instruction which one obtained in watching a man diagnose his case and proceed to carry through his line of treatment. This would take time. He felt that there should be an opportunity for anyone, young or old, to be able to follow through, systematically, cases undertaken by different operators, under different systems of treatment. Thus they would have something to guide them in their own work. He had endeavoured to put it forward in his paper that evening that in the study of orthodontics the academic side was not the only side, and he thought members would agree with him when he said that it was the exception rather than the rule to have cases exhibited by practitioners which had been completed to their proper beauty and efficiency, and in which the whole of the teeth had been maintained. It was a question of compromise. That very evening a case in point had been shown them by Mr. Packham. He did not know Mr. Packham's personal feelings in regard to that case, whether they had to infer that he regretted having treated it by extraction or felt satisfied with that treatment. But those were the things they wanted to see progressing.

Mr. Bulleid and Mr. Marsh had accurately got the idea of what he intended to convey. With regard to what Mr. Marsh had said about America, he did not think the American public would allow their orthodontic services to go by the board, because they had not as much money, individually, as they had a few years ago. It simply meant that the extravagant fees would have to be reduced. He had seen a boy who had been under treatment for eight years in a big city in the United States, and his mother had paid \$1,000 a year for eight years, and seemed quite pleased about it. But that had nothing to do with the principle of teaching and the methods of getting information.

He was pleased to hear that Mr. Chapman had as many as nine students at his course, because it must be realised that the hours were rather difficult for the post-graduate to attend classes. His own idea would be to have a systematic course in the evenings. Mr. Pitts had alluded to the difficulty of choosing the



men at whose feet they should sit and worship. He appreciated that difficulty. But what he had in mind was that these cases should come forward periodically, and their progress be noted and the reason for it, under different techniques.

He added that if he had given those present any material for fresh thinking, which might eventually lead to a change in the curriculum, or had said anything that could help the younger man who was in a difficult position in this respect, the evening might not have been entirely wasted.

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AN ordinary meeting of the Society was held at the Institute of Hygiene, 28, Portland Place, W.1, on Monday, March 7th, 1932, the President, Mr. CARL SCHELLING, in the chair.

The following paper was given by Mr. W. RUSHTON, "IS DR. ANGLE'S TEACHING SOUND?"

A film was shown by Mr. G. F. CALE-MATTEWS, "Dr. ROGERS' MUSCLE EXERCISES."

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### IS DR. ANGLE'S TEACHING SOUND?

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By WILLIAM RUSHTON, L.D.S.

I AM here to-night in response to the urgent appeal of your Honorary Secretary who had a gap to fill in the early part of the programme of the session. I shall therefore not apologise for showing you some slides which have done duty on former occasions though I have some new ones.

The subject of my paper to-night is, "Is Dr. Angle's Teaching Sound?" You may reply, "Of course it is sound. Dr. Angle, if he did not invent the word malocclusion, utilised it in such a scientific manner that he has produced a classification of irregularities which has resulted in a system, which though perhaps not perfect, yet is accepted wherever orthodontists are gathered together."

I grant you all this, and freely admit that the profession is under an obligation to Dr. Angle for inventing a system where there was none before. But I venture to maintain that the system when carried out in all cases, as advocated, is often unnecessary, uncertain, tedious, expensive and sometimes harmful. A friend has said to me that criticising Dr. Angle is waste of time, flogging a dead horse, and that his teaching will never be accepted in its entirety in this country. But as long as his text-book remains the standard and as that text-book regards extraction—which I esteem excellent practice in certain cases—as a criminal offence, I feel I must protest on the part of myself and others, especially younger practitioners, against a charge of malpraxis.

The word orthodontics had not been invented and was not adopted until this Society was formed, when of course its appellation came up for discussion. We had heard of the word orthodontia coming from the other side of the Atlantic, but my old friend Mr. Schelling, suspecting the word and remembering the classical training of his youth, sought guidance from a trusty professor of Greek and was informed that the word orthodontia was a mongrel of barbaric breed and that



the proper word should be "orthodontic," like "music" or "rhetoric," but there was no particular reason why orthodontics should not be employed like "mathematics." So our Society chose its present title not only a classical, but a modest one, nothing dogmatic or dictatorial, but ready to prove all things and hold fast that which is good.

Now the teaching of Dr. Angle is dogmatic in the extreme. It is like the laws of the Medes and Persians which allowed no alteration, modification or loophole. The law is this, "The best balance, the best harmony, the best proportions of the mouth in its relations to the other features require that there shall be the full complement of teeth, and that each tooth shall be made to occupy its normal position—normal occlusion." Having issued his canon of the law his life was spent in endeavouring to prove it and to make others believe it and practise it. His ingenious mind made mechanical contrivances to render the carrying out of his system available for all and, at a future date, he started a special school for the training of orthodontists in his tenets.

Now, once the doctrine of the necessity of normal occlusion is accepted, the practice of it is assisted by standardised regulating appliances. And let me say here that I see no reason why the products of a man's brains in the mechanical arts should not be protected any less than, say, the copyright of his book. With these appliances the orthodontist endeavours to move the patient's teeth into the condition known as normal occlusion. If the teeth are in Class I the activities of the orthodontist are directed to—as a rule—finding room for teeth which have been crowded out. But if the patient is so unfortunate as to be found in Class II or III, it becomes a much more serious matter, for it is the operator's duty to pull and push the teeth in both jaws so that the articulation becomes normal. True, this takes a long time, the child has to put up with a good deal and the results may not be permanent or beautiful, but the sacred principle of normal occlusion has been observed.

What is occlusion? It is the closing together of the teeth so that food may be masticated. Therefore, if the teeth are so placed in the jaws that they are capable of properly masticating food they are in satisfactory occlusion from a functional point of view, though the relative position of the individual teeth in either jaw may not be in accordance with what we call the normal.

Nothing less than the normal will satisfy Dr. Angle, however, who says, "Occlusion is the basis of the Science of Orthodontia. The shapes of the cusps, crowns, and roots, and even the very structural material of the teeth and their attachments are all designed for the purpose of making occlusion the one grand object, in order that they may best serve the chief purpose for which they were intended, namely the cutting and grinding of food."

What is the object of correcting irregular teeth? Is it that the child can cut and grind its food? No; if it were for this it would not be brought to the orthodontist at all so long as its teeth were in decent alignment. Children come to us to prevent their front teeth from becoming unsightly through irregularity or to cure the irregularity when present. The question of mastication does not worry any-



body ; it is taken for granted that the child, if its teeth are sound, will eat its food all right. Dr. Angle was quite right in his definition of occlusion, but when from this he builds up a theory that all regulation of the teeth should have for its object, the placing all the teeth in correct occlusion, regardless of any other factors, I class him with other rigid doctrinaires of history, who, having adopted a dogma, a theory, a canon, a cult, carry it through at whatever cost.

Now, I am not going to fall into the same error : I am not laying down the law for anybody. I am only going to say that the method I have adopted for the last forty years has brought me and my patients satisfaction. It is not a new method, it is a very old and obvious one. It is founded on the fact that the jaws of the so-called civilised communities tend to decrease in size, that Nature is engaged in one of her tremendous changes and in addition to that, certain diseases once very rare—I refer to hypertrophied tissues, i.e. adenoids and tonsils—have become very common and in my opinion are closely associated with contracted palates and deformed mandibles through inducing breathing through the mouth instead of through the nose.

At the Sixth International Dental Congress held in 1914, I raised my feeble voice, crying in the wilderness, in a "Criticism of the New School of Orthodontics." Whether I read my paper I am not quite clear, as the Congress was hurriedly broken up on the awful declaration of the war, but it is printed in the *Transactions* of the Congress. I read it again to myself the other day and found I had not a word to retract. In fact I am more than ever convinced that the "British School," as I have seen it termed by an Australian author, is on sounder lines than the "Angle School." We must not make a god of technique and dogma. Better incomplete technique and satisfactory results than perfect mechanical technique and unsatisfactory æsthetic results. If there is to be a "British School," and I do not see why not, it should be founded on the treatment of each case by the conditions presented ; its main object being that such treatment should be as speedy as possible, as æsthetic as possible, and that the teeth should be left in stable equilibrium, the things in which the Angle system is markedly lacking.

Mr. Rowlett has lately put the matter very incisively : "Dr. Angle, by his classification of malocclusion upon the articulation of the six-year-old molar, brought order out of chaos in orthodontic practice. Eureka! say the members of the dental profession ; the question of malocclusion is solved, all that is necessary is to put in arches and drag or push the teeth into their position of normal occlusion, and all will be well. It was soon found," he continues, "that a tooth could be moved anywhere and held in any position, if the orthodontist were sufficiently ingenious and the patient sufficiently tolerant ; but to make the tooth retain its position when the apparatus has been removed was a very different matter. Orthodontists have now realised that mechanical appliances, however ingenious in their construction, and however skilfully applied, do not wholly solve the problem."

Dr. Angle was evidently under the impression that, firstly, Nature never made mistakes even in the position of the first molar, and secondly, he did not or would not realise that the diminution in the



size of the arches which has been going on for countless ages has been speeded up in modern times. He is like King Canute who made a vain attempt to stay the tide and is in effect out-of-date instead of being in the forefront of progress.

Furthermore, I maintain that in the practice of orthodontics as in the practice of prosthetics, the dental practitioner should be an artist and should not be bound by an inflexible dogma like the galley-slave to his oar. In many cases the bony structure is so altered that all the King's horses and all the King's men cannot make Humpty Dumpty as he should have been. In those cases especially where the jaws are too prominent an excellent opportunity presents itself for improving the features by judicious extraction. Dr. Angle, of course, condemns extraction which he stigmatises as "mutilation," a contemptuous as well as an incorrect term.

The way that Dr. Angle has of regarding malocclusion as a cause is most unscientific and unsound. To quote a former paper of mine, "Dr. Angle attaches an altogether too great importance to malocclusion. He seems to regard it as a prime causative factor instead of accepting it as one phenomenon and that not always the most important one in a varying group of phenomena." He says, "The effect of malocclusion upon the facial lines" is so and so. He should have said, "Certain conditions modifying the growth of the jaws produce disturbance of the facial lines and also produce malocclusion." It is not the malocclusion which is the cause but one of the effects of mouth-breathing or something else. Then as regards Dr. Angle's statement, "In proportion as malocclusion exists, the function of the teeth and speech are impaired," I reply that we often meet with cases where the occlusion is normal, but the beauty of the subject is marred by say all the teeth being too prominent. Again we often see cases in which malocclusion exists where the facial lines are harmonious and beautiful, the teeth functional, the speech unimpaired.

Now, one of the most remarkable paragraphs in Dr. Angle's seventh edition is as follows: "There is a principle which, if intelligently applied, brings us the nearest to an ideal result possible with each given patient—that of balance, of symmetry. We should be able to detect not whether the lines of the face conform to some certain standard, but whether the features of each individual—that is the forehead, the nose, the chin, the lips, balance and harmonise or not and—what concerns us most as orthodontists—whether the mouth is in harmonious relation with the other features, and if not, what is necessary to establish its proper balance." Now, I agree with every word of this, it raises the orthodontist to what he should be—an artist, not a slave to a formula.

But our hopes are soon dashed for we are told that the ability to determine the proper balance of the features is rare, and therefore we must fall back on a law so plain and simple that all can understand and apply it. It is that the best balance, the best harmony, the best proportions of the mouth in its relations to the other features require that there shall be the full complement of teeth and that each tooth shall be made to occupy its normal position—normal occlusion. "This law," he goes on to say, "may be regarded as one of the corner



stones of the new school of orthodontia in contradistinction to the teaching that has always dominated the practice of the old school—that of leaving to the individual judgment of the operator, without any standard or law, the determination of the requirements in orthodontic operations in each given case. To satisfy this individual judgment, extraction was often, and in complex cases always, resorted to. Its unfortunate and inartistic results may be seen in every community. It is gratifying to note, however, that this fallacious teaching and pernicious practice are rapidly passing and will doubtless soon become mere matters of history.” In reply to that I might say that the unfortunate results of wearing appliances for long periods and the effects of retaining all the teeth at any cost are more serious than any results of extraction.

A matter which seems to me of great importance in deciding whether to expand or extract, is that of the incidence of dental caries. Apart from the fact that the wearing of an appliance may induce caries, there is the fact that teeth in close proximity are more likely to decay than those not so crowded. Where room is made by extraction there is therefore less liability to caries. There is also less liability to pyorrhœa which, there is good reason to believe, in certain cases, has been encouraged by the long-continued wearing of fixed appliances. There is also less chance of wisdom tooth trouble in later life.

The two points I most specially stress are rapidity of treatment and the assurance that when you have brought the teeth into satisfactory alignment, they will stay there.

Dr. Angle says, that “Orthodontia, when mastered and practiced as a speciality, becomes one of the most fascinating of the professions and gratifying in its practice, having as it does a clientele far more nearly ideal than is to be found in any other branch of medicine, composed of patients in health and in the flower of youth—and that, too, of the cultured and affluent.”

And that brings me to another point. All our patients are not affluent and the great mass of the people who will more and more require orthodontic treatment are not only not affluent, but poor. Orthodontic treatment is now becoming a recognised section of the work of medical officers of health and it is important for the children under their care that orthodontic treatment should be rapid and effective. My own feeling is that in many cases the poor will be treated better than the rich. My friend Dr. Steadman has done good work in this direction.

I notice with pleasure that Sir Norman Bennett has become lecturer on orthodontics at the Royal Dental Hospital of London. From what I know of Sir Norman, I foresee that the teaching will be on sane and rational lines, all the conditions ruling each case being taken into consideration. As regards fixed and removable appliances, I agree with him that there is room for both. There is also room for a general simplification of the whole thing for the general dental practitioner, who, as Sir Norman says, is terrified by the complexity of the problems which are often depicted in our journals.

To sum up this brief and somewhat sketchy paper I would say, prevent the necessity of regulation by impressing upon parents the



importance of mastication and of nose breathing ; warn them of the signs of nasal obstruction and of the dangers connected with adenoids and the tonsils.

If the teeth are fairly regular and the features pleasing, do not regulate at all simply on account of the occlusion not being quite normal.

When regulation can be accomplished by judicious extraction only, do not use any appliance whatever.

If it is considered advisable to extract the first permanent molars, one need not hesitate to do so before the eruption of the second.

Use whatever appliances are most suited for the case but do not use them too long. If you do there is something wrong with the treatment of the case. Regard your patient as one whom you wish to regard you as a lifelong friend.

#### DISCUSSION.

The PRESIDENT said some members were no doubt quite able and willing to defend Dr. Angle's position. Mr. Rushton had put forward the point of view of those who claimed the right to exercise their independent judgment in opposition to any who sought to impose their own quite questionable regulations upon those practitioners who ventured to differ from them.

Mr. BOCQUET BULL, after thanking Mr. Rushton for broadcasting from Portland Place what many people thought and for showing through the lantern a number of excellent results of his treatment, said that he quite agreed with what Mr. Rushton had said about the object of correcting irregular teeth ; indeed, he would go a little further. He had made a practice during the last twelve or thirteen years of asking new patients regularly the reason for their attendance at hospital. These patients numbered from 450 to 500 every year, the chief sources being the school clinics and the parents of the children ; outside hospitals, patients' dentists and patients' doctors made up the rest. The answers given at first were distinctly discouraging, complete ignorance of the reason frequently being shown. But when a reasoned answer was obtained, it was always to the effect that the attendance was for the purpose of having the front teeth straightened or the front teeth pushed in. In his recollection, after seeing as many as 400 or 500 cases a year for the last thirteen years, he had never had a patient come up with any other request than those he had just given. This, he thought, fully bore out Mr. Rushton's statement as to why patients presented themselves for treatment ; it was purely for the appearance of the front teeth, and for no other reason. It seemed a pity, but it was a fact. With regard to the status of the patients, again he agreed with Mr. Rushton when he said that the patients were not affluent. If attention was to be confined in these days to the few patients who wended their way to Harley Street, it might be argued that patients were affluent, though even then one would be an optimist. But the treatment of the wealthy few, ignoring the innumerable poor, was surely not the ideal for which members of the Society were working.

Leaving apart for the moment the question as to the truth of Angle's teaching, he had undoubtedly failed to prescribe a treatment which fitted in with the average boy or girl, from the point of view of time, money, ability to attend, general convenience, and many other things too numerous to mention. It was of little use to work out an elaborate treatment, if such treatment could only be applied to a bare 5 per cent. of the cases, and strong terms could well be used when the originator of that treatment dogmatically stated that all other treatment was an offence. With regard to the actual teachings of Angle, he could only think that he became obsessed and intrigued with his scheme of treatment, and the apparatus connected with it (of which, by the way, he was not the inventor, although he elaborated it) to such an extent that he saw that as a complete scheme it would fail if he admitted the policy of extraction of the teeth to a place therein, and so



he resolutely set his face against what he described as a pernicious practice. The speaker could think of no other reason why a man should act in such a manner when so many obvious cases to the contrary stared him daily in the face. He thought the time had passed when Angle's book was considered over here as the standard; he always recommended Norman Bennett and Chapman. It had been argued by Angle's advocates that if one was capable of the so-called Angle technique then all was well, and his methods would be appreciated as a matter of course—a very poor compliment to the members of the dental profession, and one which was quite unjustified. The man to whom the speaker had been articulated years ago was one of the most brilliant craftsmen in all ways that he had met, a man who could and did panel and adorn with carving the whole of his dining room, and at the other extreme produced some most beautifully made silver and enamelled jewellery, facts leaving very little doubt that as a craftsman he was exceptional. But the point was that he had a very good suburban practice. Discussing Angle's methods with him one day, he was obviously interested and enthusiastic. The speaker saw him many months later, when he told him that from the practical point of view he had given up the methods as being wholly incompatible with private practice. He was the type of professional man who would make no half-hearted attempt at anything that he went in for, and the speaker regarded his decision as being of great value.

Much of what Angle had written was good and practicable, much entirely the reverse. The obvious thing was to take the good and practicable part, and, welding it with the teachings and findings of others, build up something which was not only the result of one man's brain, but the accumulation of the experience and ingenuity of many. He did not entirely agree with Mr. Rushton when he stated that when regulation could be accomplished by judicious extraction only, no appliance whatever should be used. There were certain cases, such as the extraction of premolars to make room for outstanding canines, where it was well to insert a small plate with spurs to prevent the teeth distal to the space from coming forward. Further, when Mr. Rushton said, "If it is considered advisable to extract the first permanent molars, one need not hesitate to do so before the eruption of the second," he would add, "but beware of closing the bite."

Mr. H. C. VISICK said that there were many provocative points in Mr. Rushton's paper. He noticed that Mr. Rushton had said that he did not see why the product of a man's brains should not be protected any less than the copyright of his book. Two or three members that evening had been received into the Society and had signed the Obligation Book, which involved the obligation not to patent any appliance used in the mouth. He for one thought this was a really good rule, which he hoped the Society would never withdraw. Its members should not be financially interested in any appliances used in orthodontics. He could not help thinking that a good deal of the dogmatism of the Angle school of orthodontics was due to that very fact, that the appliances were patented, and proved a large source of revenue. If he, the speaker, were getting £5,000 a year from the use of some appliance, he would feel that he had 5,000 very good reasons for thinking that his appliance was better than somebody else's. He felt that the Angle school had in a way been a sort of advertising agency for these appliances. He hoped he was not too severe in his criticism in saying that, but he trusted that the Society would always stick to its principles in this respect. Mr. Rushton had said that he did not see why there should not be a British school of orthodontics, and he had suggested three principles. These were very good ones, but for his own part he would like to see the second one put first. The three principles were, that treatment should be as speedy as possible, as æsthetic as possible, and that the teeth should be left in stable equilibrium. He thought that æsthetic treatment was of more importance than speedy treatment. This brought him to the point of the ideal treatment, where the teeth were retained, and the treatment was long and expensive. He had always felt that in dental practice cheap work could not be done at one moment and at the next moment an expensive kind. If there were two kinds of work it would be found quickly that the inferior, being the easier, would come to dominate practice, and lower the ideal. Of course, there were cases in every practice where a long treatment was not possible on the ground,



not only of expense, but of convenience for the patient. But they should all maintain their ideal. He did not for a moment quarrel with the idea of extraction, but he hoped that none of the younger members would go away feeling that fixed appliances for expansion and inter-maxillary traction were impossible for general practitioners. They were not impossible, and they all ought to strive to do these things. Mr. Rushton had spoken of the unfortunate results of wearing appliances for long periods, and had said that the effects of retaining all the teeth at any cost were more serious than any results of extraction. There he could not agree with him. He had seen some terrible results from extraction, far worse than anything caused by appliances. Further, Mr. Rushton had said: "If it is considered advisable to extract the first permanent molars, one need not hesitate to do so before the eruption of the second." He wondered whether that meant advisable to extract for caries or for orthodontic purposes. The first permanent molars were such wonderful teeth, the prop of the whole arch, and he could not conceive any orthodontic reason for extraction.

Mr. NORMAN GRAY, after referring to the crowded audience which showed how Mr. Rushton's paper was appreciated, pointed out that although it had shown Angle's teaching to be unsuond, we must remember that Angle made his hypothesis many years ago. Since that time the Angle school generally, had shifted very considerably from the position which gave rise to that hypothesis. There was a sufficient uniformity in the diversity among human teeth to make it clear that some general principles might be applied. Dr. Angle started that work and gave a fabric upon which further work might be developed. He started with a working hypothesis. To make a beginning it was necessary to assume certain things to be true. Many orthodontists since then had formulated a more workable hypothesis, using ideal occlusion as a basis. Dr. Hellman, a leading orthodontist of New York, and an old graduate of the Angle school, had presented a paper, "The Study of the Variation in Occlusion," which showed that he had progressed far from the original teachings of Dr. Angle. He (the speaker) had taken a course of orthodontic in the States, and the teaching staffs were all graduates of the Angle school, but none of them spoke in Angle's dogmatic way. One of the main points in their teaching was that the hypothesis of ideally inclined planes and cusps was not sound. Reference might be made also to the work of Dr. Sheldon Friel. Dr. Friel had spent a great part of his life thinking out his subject. Because Dr. Angle's original hypothesis had often proved fallacious, it would be a shame to turn all on one side and teach extraction as a routine treatment. Mr. Rushton had referred to the doctrine of normal occlusion. What is "normal"? What does medicine understand by a normal stomach, a normal spine, a normal foot? Normal is something which performs its function efficiently with the organism as a whole. The definition of normal occlusion given at the Graduates' School of Orthodontics in Philadelphia was: "That condition of tooth relation which was the most effective in maintaining and establishing in its most stable form the whole organisation of the individual." While this was vastly different from Dr. Angle's hypothesis, let us bear in mind that each tooth has a function before we ruthlessly extract. The prevalence of dental problems to-day meant that the teeth are out of harmony with the conditions of the individual's life. It is not always the teeth that are wrong in the first instance, but the conditions which are operating.

Mr. A. T. PIRTS said that he had much enjoyed Mr. Rushton's racy reminiscences. They contained a great deal of commonsense. Mr. Rushton might almost be regarded as the protagonist of the British school. But he thought that it might not be very difficult to write another paper bearing the heading, "Is Mr. Rushton's Teaching Sound?" He could not help feeling that this fashion of pouring contempt on Angle and all his works had been a little overdone. It was not that he was an advocate or disciple of the Angle school, but after all, Angle was a great historical figure in the evolution of orthodontics. Like many other systems propounded by pioneers of a subject, it had tended to become fossilised, and after having aided enormously in the progress of orthodontics, it had even begun to impose shackles. Dr. Angle, like many others, was inclined to regard his teaching as forming a sort of inspired canon, and that nothing should be added to or subtracted from it. That was one of the unfortunate frailties of human



nature from which many great men were not free. Angle certainly suffered from it, and therefore his teaching in some respects had done harm. But while there was much on the debit side there was also a great amount on the credit side which ought to make us eternally grateful. His classification showed the simplicity of genius. It was not a complete one, but straightway it fitted in with certain well-recognised types which everyone could recognise. Angle gave us a terminology which fitted aptly the conditions described, and it was one which was used throughout the whole world wherever orthodontics was practised. That was, he thought, a very great thing to do. Then, again, on the technical side, he realised what Mr. Visick had said, that when appliances got patented there was a tendency to push them too far; but Angle was really the first man to make such appliances practicable. It had been stated that there were some pre-Angle appliances. Well, there were pre-Darwinian thinkers who adumbrated the idea of evolution before Darwin (not that he would follow the comparison between Darwin and Angle very far), but Darwin was the man who really brought evolution into scientific thought, and Angle was the man who first designed a fixed appliance that was a really practicable thing. The evolution of fixed appliances, to which orthodontic treatment owed so much, really did commence with Angle. Nevertheless, where it was a question of treatment, he found himself in hearty sympathy with a very great deal of what Mr. Rushton had said. He thought it was easy to push extraction too far, and, like Mr. Visick, he had seen many unfortunate results from so doing.

Miss K. C. SMYTH said that she thought it had to be realised that occlusion and malocclusion were not just a matter of the relationships of cusps and fossæ, although these were important, but that the whole thing was dependent on bone growth. If any success were to be made of cases, that must be taken into account, and orthodontists must not concentrate exclusively on the crowns of the teeth. She quite agreed that in some cases expansion was absolutely contra-indicated. One point which Mr. Rushton had mentioned was "dragging" and "pushing" teeth. She did not think that those terms need now be used, because recent research had proved that if pressure, which could be of different kinds, was used intelligently instead of ignorantly as in the past, the teeth need not be pushed violently, in the sense generally understood when this expression is used. They could be moved in the manner and at the speed that was best for them. As to the reason for which parents brought their children to the orthodontist, she believed that in nearly every case it was on account of the appearance of the front teeth, as had been stated, but she had come across some cases in which this was not so. In one of her cases, the buccal surfaces of all the lower teeth were in contact with the lingual surfaces of the upper. That boy was brought to her because he had to spend about an hour and a half at every meal. Even in less marked cases than that, if one explained the position to the parents they were quick to appreciate the importance of the improvement in the biting powers of dentures which were brought into better occlusion. Some years ago she had shown to the Society a case in which there was normal relationship of all the teeth as far as was possible in the circumstances, but with spaces between almost all the teeth from the premolars forward, uppers and lowers. That was apparently a case of excessive bone development, and although it could not be said that the occlusion was abnormal in any other respect but the spacing of the teeth, yet the appearance of the child was certainly abnormal, being definitely prognathous. This was a case where attempts to alter the occlusion would be useless. She did not know how it would be possible to treat such a case. Probably it would be one which must be left alone.

Mr. W. RUSHTON, in reply, said that he thought it came out very clearly in the discussion that the day of dogmatism was past, and the day of commonsense was beginning. It had been suggested that he was flogging a dead horse in criticising Angle, but he certainly thought there was something which ought to be said against some of Angle's teaching. He did not despise Angle, as Mr. Pitts had rather suggested, but it was Angle who despised him—a very different matter. He recognised Angle, as he had said in his paper, as one who reduced to a great extent a chaotic confusion into something approaching cosmos. He quite agreed with Mr. Bull that it was always absurd to cut off one's line of retreat and say



one would use no appliance whatever. The wise man would use an appliance whenever it was called for. With regard to Mr. Bull's remarks about speed, he still thought that speed, to put it in the legal way, was of the essence of the contract. Dr. Stanley Colyer had shown pretty conclusively that long-continued regulation with fixed appliances had a very deleterious action on the teeth and on the gums, and possibly, he said, led to pyorrhœa. But the point was that they must regard all the circumstances of the case, take into account the person's income, the person's features, and so forth, before they made their decision. He did not make a rule of extracting the first molar, but when it was a case of extensive caries it was a good practice, which he was prepared to defend. Mr. Gray had said that Dr. Angle had given them a working hypothesis. He had done so, and the present speaker was one of the first to accept it. Angle was a great man, but, like so many other great men, he overtopped himself. He was glad to learn that his ideas were being more and more modified into something rational and sensible. He strongly objected to Mr. Gray's expression, so common in some quarters among the Angleites, "ruthless extraction." It was not "ruthless." One might just as well say of a surgeon that he did a "ruthless" appendicectomy. He thanked Miss Smyth for her observations. One of the points to bear in mind was what Nature was going to do and how she was going to help the orthodontists by bone growth.

The PRESIDENT expressed the thanks of the Society to Mr. Rushton and to Mr. Cale Matthews for their contributions.

The attendance at the meeting was one of the largest ever recorded in the history of the Society, and a number of members stood throughout the whole of the proceedings.

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## DR. ROGERS' MUSCLE EXERCISES.

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By G. F. CALE MATTHEWS, L.D.S.

THE author showed and commented on a film entitled "Dr. Rogers' Muscle Exercises." In some preliminary remarks before the film was shown he said that these muscle exercises had been brought into prominence by Dr. Rogers of Boston, U.S.A. The educative value of the film was, he thought, unquestionable, but some doubt had been expressed lately as to the physiological and biological accuracy of the exercises. There was, however, evidence to prove their value from practical use. It had been his privilege to see many of these exercises, and to spend some time with Dr. Rogers and examine his really extraordinary results, many of them obtained without the use of any appliance whatsoever.

The principle underlying the use of these exercises was first to remove any obstruction in the way of individually misplaced teeth, or, as Dr. Rogers put it, the removal of mechanical interference. This was done by appliances, after which the exercises came into use. It was somewhat uncanny to see the results obtained, and he ventured to suggest that no one yet had been so successful as the initiator. Unquestionably there was a psychological effect in his personal attitude to his patients and the wonderful persuasive control he had over children. The speaker had seen open-bite treated entirely by exercises of the lip muscles. There was a fundamental principle underlying the method of treatment, namely, the power of muscular relaxation.

By the kindness of Mr. Cutler, the hon. secretary of the society, Mr. Cale Matthews was able to demonstrate on him some of the principles of the exercises. He pointed out that the organisation of the exercises might possibly be found to be very tedious and exacting work, but if one was sufficiently enthusiastic, it would be found of value in the treatment of the post-normal cases. He drew attention to the curious attitude of the child with post-normality—the flat hollow chest, the depressed chin, the head carried forward, the mouth open, the whole attitude suggesting weakness and deficiency. In the early stages of the treatment it would be found helpful to encourage that child to get his vertical attitude into some proper position, by first of all putting him on the floor in the prone position. One then endeavoured to get him to relax, and immediately one's attention was drawn to the difficulty of muscular relaxation. He believed that there were not 5 per cent. of the people in that room who could lie on the floor and give themselves complete muscular relaxation. The palms were thrust at right-angles to the body, the legs were flexed as high up as possible, and the knees were dropped apart. A book was placed in the hollow of the back of the neck, and gradually with practice the spine and the head were made to lie perfectly horizontally on the floor. The effect of this was automatically to bring forward the chin without any muscular effort whatsoever.

With Mr. Cutler's assistance an effective demonstration of the relaxation of the muscles was made, and the film shown proved very instructive.

#### DISCUSSION.

The PRESIDENT mentioned that there was a voluntary action of the jaws used very much by certain people who were accustomed to take chewing gum. He wished to know what the effect of this had upon the facial muscular development of those people. Did it improve their looks or cause deterioration? Did it make them more efficient masticators or less?

Mr. CALE MATTHEWS said that he did not think the film was quite a matter for discussion, but he would like on behalf of those present to tender the thanks of the Society to Dr. Rogers for allowing this film to be kept over here. He believed that so far as this type of work went, Dr. Rogers has a marked individual personality. He was sure that Dr. Rogers would value a vote of thanks from the Society, and he hoped that he might be empowered to send him a letter conveying such an expression. The vote of thanks to Dr. Rogers was heartily accorded.



A MEETING of the Society was held at 28, Portland Place, W.1, on Monday, May 2nd, 1932.

The following Demonstrations were given :—

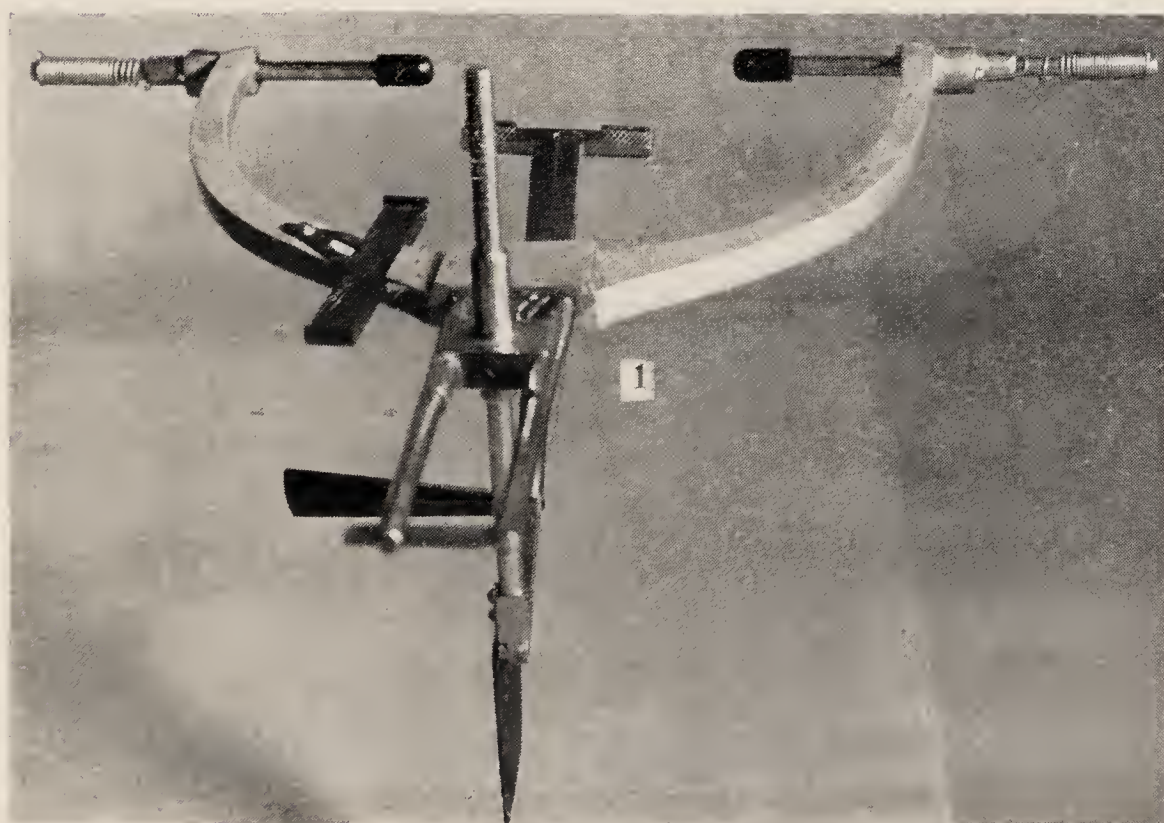
**Instruments for ascertaining the angle that the tooth plane makes with the Frankfurt Horizontal Plane and transferring this to the plaster models. (A and B.)**

**An instrument for projecting a drawing of the teeth on to a plane surface and an instrument for increasing the size of small drawings. (C and D.)**

By SHELDON FRIEL, Sc.D., M.Dent.Sc.U.Dublin.

THE object of these instruments is to enable the top and bottom of these models to be cut parallel to the Frankfurt Horizontal Plane, so that the plaster teeth are oriented to the Frankfurt Plane to the same degree as occurs in the head, when erect.

The Frankfurt Horizontal Plane passes through the lowest point of the lower border of the orbits and through the highest points of the bony external auditory meatus. (Except in the dried skull these points cannot be accurately located.) It has been found by Campion and Young (*Journal of Anatomy*, Volume LXV, Part III, April, 1931) that the Frankfurt Plane passes through a point 8.26 mm.  $\pm$  0.35 above the centre of the cartilagenous meatus with a range of variation from 5.3 mm. to 14.5 mm. in 36  $\pm$  cases; that the supratragal notch on an average lies 1.27 mm. .35 above the plane in fourteen



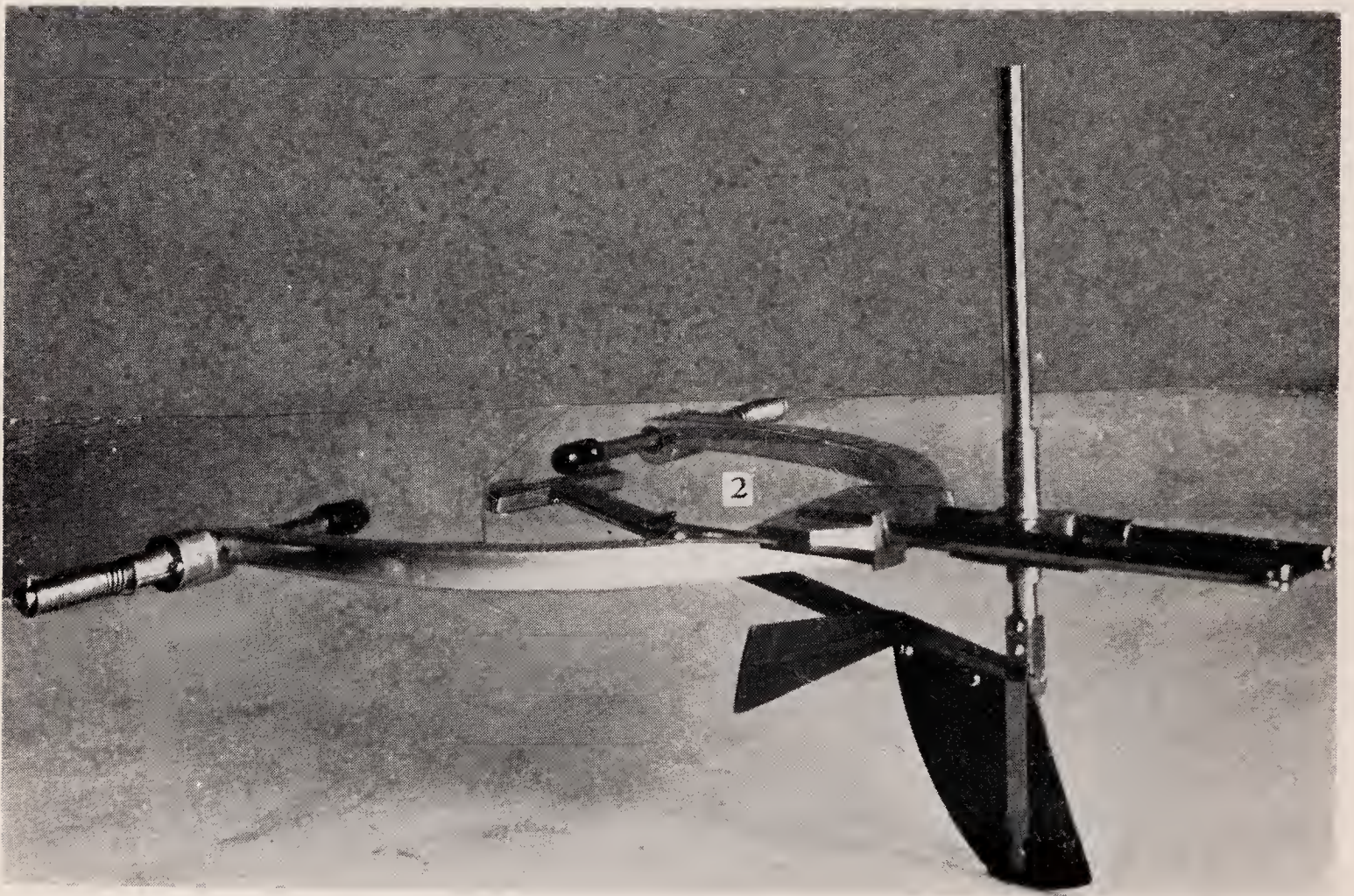


cases with a range of variation of 1 mm. below, to 37 mm. above. From this it can be seen that the Frankfurt Plane cannot be accurately determined in the living subject, no matter what anatomical point is used to determine it. Notwithstanding this, the accuracy of the method is sufficient to orient the teeth of the cast so that they appear as in the head.

The tooth plane used passes through the point of the medio-lingual cusp of each upper first permanent molar and through the incisal edges of the central incisors. Where the first permanent molar has not erupted, it passes through the medio-lingual cusp of the second deciduous molar.

The first instrument consists of a bow with an ear plunger at each end, and a sliding sight level with its upper surface. Attached to it is a rod slideable vertically and horizontally which has hinged to its lower end another rod ending in a T piece. A scale and pointer enable the angles between these rods to be read.

In use, the T piece rests on the medio-lingual cusp of the first permanent molars and the incisal edges of the upper centrals and the plungers on the bow in the ears. Alignment of the sight on the lowest point of the orbit then brings the upper surface of the bow into the Frankfurt Plane, since the centres of the ear plungers are 8 mm. below that surface. The angle between the two rods will then be the angle which the tooth plane makes with the Frankfurt Plane. (Figs. 1 and 2.)

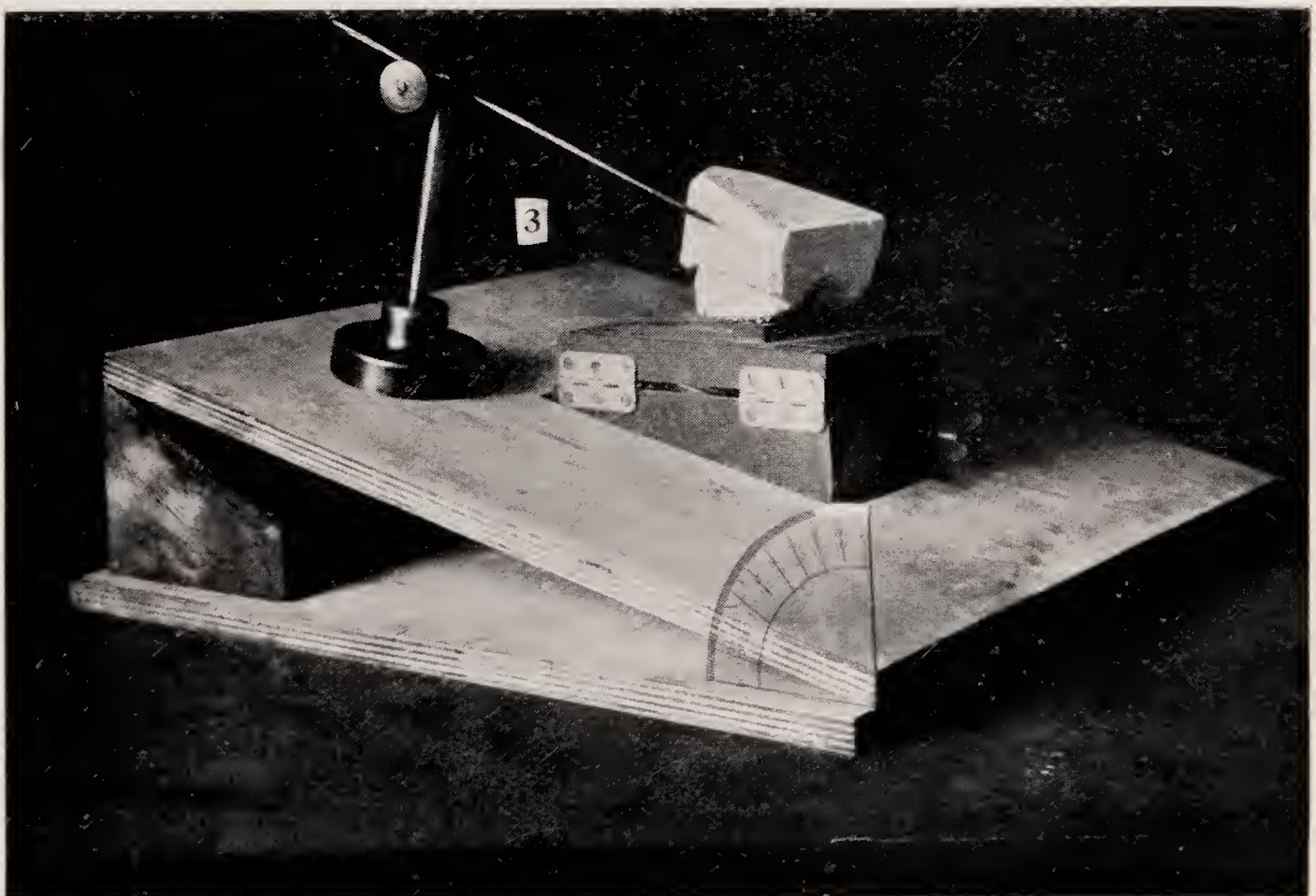




The second instrument consists of a horizontal board, in the centre of which is attached a rectangular block. To one end of this board is hinged a second board with a hole in the centre through which the block can protrude. A protractor is fixed so that its centre coincides with that of the hinge. The model is placed on the rubber T on the block in the same position as the T piece of the first instrument was placed on the teeth. The second plane is fixed at the angle that has been found previously, and a scribe is run round the upper board marking the model. This mark is parallel to the Frankfurt Plane. The top of the model is cut parallel to this mark and the models finished in the usual way. (Fig. 3.)

Since this instrument was shown at the Second International Orthodontic Congress, it has been slightly modified. A second protractor has been added at right angles to the original protractor, to record any lateral deviation of the Frankfurt Plane to the tooth plane. The second instrument has been similarly altered.

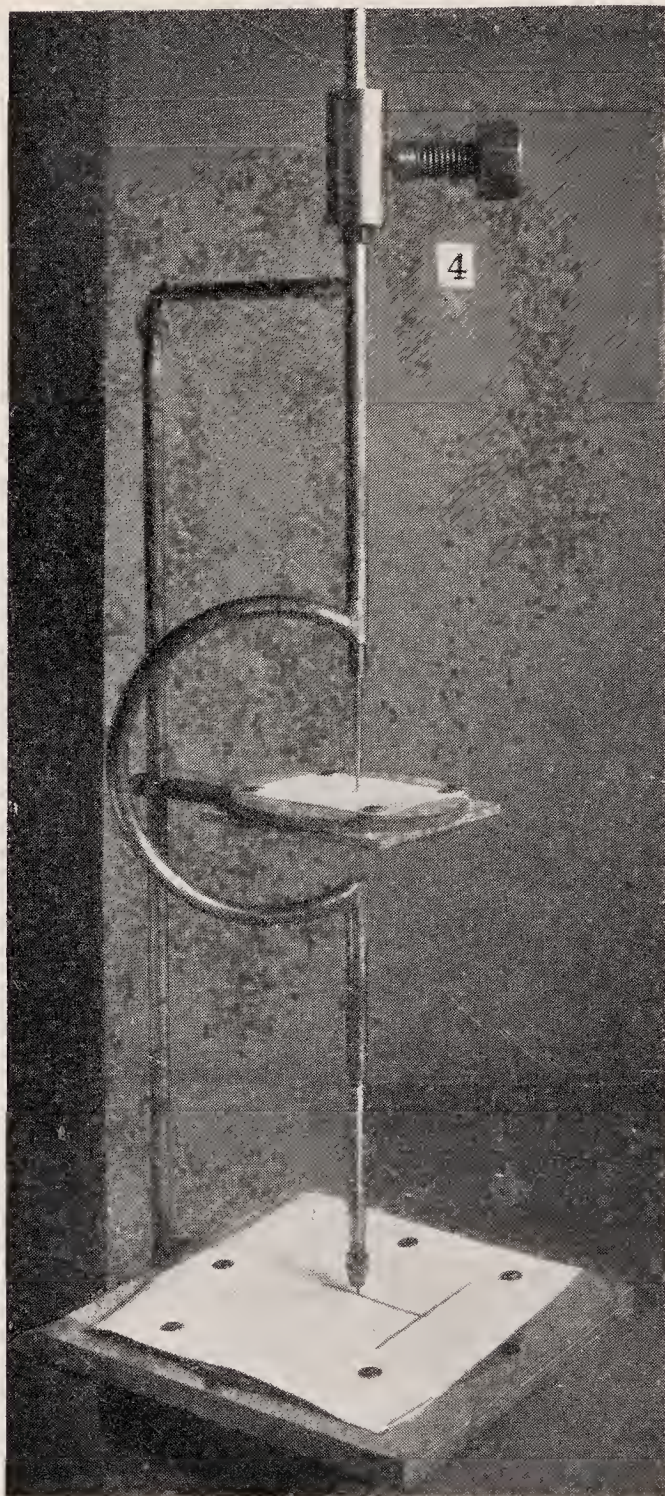
The third instrument, a Stereograph, was designed and made by Dr. Rudolph Schwarz, of Basel, and demonstrated and described by him at the First and Second International Orthodontic Congresses.





The fourth instrument was designed and made by Mr. Percy Nugent, motor engineer, Lad Lane, Dublin, for increasing to twice their original size the drawing made of the model of the teeth by Dr. Schwarz's Stereograph. (Fig. 4.)

The principle of the instrument is based on a pendulum. The original drawing is placed on a platform equal distance from the pivot of the pendulum and the bottom platform. On the bottom platform is traced the enlarged drawing. A sliding steel pointer follows the original drawing. The essential point is that the pivot of the pendulum, the sliding steel pointer and the sliding pencil are always in the same straight line.





**Demonstrations by means of models to exemplify principles to be considered when extraction is a part of Orthodontic treatment.**

By HAROLD CHAPMAN, L.D.S.Eng.

It was pointed out that extraction for orthodontic purposes may be considered from three points of view. 1. General ; 2. Angle Classification ; 3. Individual teeth. It was also emphasised that these principles or rules were not to be followed slavishly, but were to be interpreted with judgment and common sense in each individual case. In particular it was mentioned that extraction of lower teeth must be done with considerable discretion and that only very rarely should it be resorted to in cases of post-normal occlusion ; also, that in cases where the arch-relationship is normal it is frequently better to leave a somewhat crowded condition in the lower arch than to attempt to improve the alignment of the teeth, as extraction, especially of incisors, involves a risk of collapse of this arch, without any benefit to the alignment of the teeth. This is particularly liable to happen in the cases of extraction of incisors, but seems less likely to happen when premolars are removed. If an incisor has to be removed, and no tooth movement is required, then it is probably better to defer extraction as long as possible, say until the patient is 18 years of age. One great advantage of maintaining the lower arch intact is that it does not collapse and therefore maintains the size of the upper arch ; should it collapse, then the upper arch will collapse with it and so offset any improvement in alignment which might otherwise be obtained.

**Radiographs.**

Dr. David A. Imrie showed some radiographs of particular interest in orthodontia, and demonstrated a technique for the localisation of unerupted teeth in both maxillæ and mandible.

He, also, showed radiographs with templates of the profile where malposition and irregular eruption of the teeth had produced corresponding defects of the profile lines. These templates could be preserved and the progress of the correction of the defects could be checked.

There was a demonstration of radiographs showing extraordinary eruption of teeth.

**Joining Stainless Steel Wires.**

Mr. H. G. WATKIN demonstrated a method of effectually joining two stainless steel wires together. He slightly bruised the wires at the points to be united, bound them with about five turns of No. 32 gauge tinned copper wire and then soldered the copper wire, using zinc chloride as a flux. This formed a metal ferrule on two uneven surfaces and made a strong mechanical joint, but the solder only stuck to the copper wire. Since the time of the demonstration, Mr. W. A. Bulleid has pointed out that if a flux is used—which is made by dissolving Z.Cl.<sub>2</sub> sticks to saturation in a 50 per cent. solution of H.Cl.—a proper soldered joint can be obtained and bruising of the wire is

unnecessary. Mr. Watkin is now using this method and finds it very efficient. The binding is still necessary and, of course, adds greatly to the strength of the joint.

Mr. Watkin also demonstrated the use of a special pair of pliers which he has designed which greatly facilitates the bending of wires for orthodontic bows, etc. The Dental Manufacturing Co. will soon have these pliers on sale.

### Fixed Appliances Technique.

By C. L. ENDICOTT, L.D.S., R.C.S.Eng.

DEMONSTRATING by means of casts, and appliances on casts, certain points relating to anchor band technique, impressions, lingual arches and the labial arch wire. Two methods were shown of the separation of the contact points previous to fitting anchor bands, one by the use of brass-wire ligatures and the other by the use of heavy silk ligatures drawn under the contact by a loop of dental floss which had been passed down between the contact points. Measurements for anchor bands by the direct method were also shown, and a recommendation that all bands should be removed from the mouth at intervals of six months, the teeth cleaned and inspected, and the bands freshly cemented.

Other casts were shown describing the assembling of lingual and labial arches and emphasising certain points in soldering. For example :—

In the construction of Meershon type of lingual arch the solder placed on the half-round tube and flowed from this point on to the bands away from the tube minimises the quantity of solder and avoids having it flowed into the tube and thus interfering with the fit of the half-round pin. Correspondingly, solder placed on the end of the half-round wire and flown away from this point on to the lingual arch wire in making that attachment, assists in the same manner.

In the attaching of auxiliary springs the solder is applied to the end of the finger spring and again flowed away from the small wire on to the lingual arch.

The alignment of appliances should be simple, and contain the least possible number of bends.

Other types of locks and attachments to anchor bands were also demonstrated, in which round vertical tubes were used in the manner advocated by Jackson.

A method of attaching precious metal auxiliary wire to a base metal labial arch was also shown, and consisted of soldering the auxiliary spring to a small piece of round tubing into which the arch fitted, and fastening it into position on the arch by the use of a small quantity of soft solder.





AN ordinary meeting of the Society was held at Manson House, 26, Portland Place, W.1, on Monday, October 3rd, 1932, Mr. CARL SCHELLING (President) in the chair.

The minutes of the previous ordinary meeting were read and confirmed.

The following were elected members of the Society : N. H. Kettlewell, L.D.S., H.D.D., L.M.S.S.A. (Clifton, Bristol), V. H. Bascombe, L.D.S., R.C.S.Eng. (Earl's Court Road, S.W.), Miss Mildred Still, L.D.S., R.C.S.Eng. (Norbury, S.W.).

Mr. H. C. VISICK and Mr. N. GRAY gave papers as follows :—

### **THE POSSIBILITIES OF, AND DIFFICULTIES ASSOCIATED WITH, FIXED APPLIANCE WORK.**

By H. C. VISICK, L.D.S.

To disarm criticism I am going to apologise for the fact that my share of this paper hardly justifies the title. That is because the title was chosen first, and when I proceeded to write I realised that I could not possibly do more than mention a few of the uses I had found in general practice for fixed appliances, and some of the difficulties I felt I had overcome.

I was one of those privileged who had an opportunity recently of seeing the work of some of the orthodontic specialists in Canada. What I saw impressed me with the fact that we in this country are greatly handicapped by the domestic and scholastic conditions over here. But perhaps the chief difficulty is that we are not "tooth-minded," to use an ugly but expressive word. I will give one example. I saw in the office of one of Toronto's orthodontists a girl of about 12 years of age. It did not seem to me at all a serious case of malocclusion, but there she was with a band on every single tooth in her head, upper and lower—twenty-four in all! I asked the operator how long he reckoned it took him to put on the apparatus before he started treatment. His reply was, "About twenty hours' work in the mouth"! It would greatly interest me to hear any man try and convince an English schoolmistress of the need for such lengthy treatment. In face of cases like that, one is a mere dabbler in orthodontics.

I have approached my subject rather from the point of view of the general practitioner who wonders if he is wise in attempting to make use of fixed apparatus.

A great deal has lately been said about the technical difficulties of this work and its dangers to the teeth and soft tissues, and it may be that some of the more timid and conservative members are hesitating and wondering if they ought to leave fixed apparatus to the specialist alone, and confine themselves to more simple appliances. Now I want to say at once that by so doing they will deprive their patients of certain benefits and services, which in these days they may well look for from the general practitioner; and also they will most certainly miss one of the greatest joys in life, and that is in the sense of achievement which comes with any success, however small. Fixed appliances are being used more and more, and it is a poor thing if a dentist is so behind the



times that he is unable even to repair or adjust such an appliance for a patient who may be visiting his town.

Now as to the "possibilities." There are almost illimitable fields of use for the specialist, and I feel it would be presumption on my part to even attempt to describe them. But I would rather point out the possibilities of these fixed appliances for the general practitioner, and mention some of the simpler cases which can be better, and possibly only, treated with fixed apparatus.

Class II, Division I cases, treated by extraction, are pre-eminently suited for correction with a fixed appliance. A plain arch sliding in buccal tubes on molar bands, with elastics for the motive power, will work smoothly and surely, and with little attention. Most important of all, the front teeth can be retracted without any forward movement of the back teeth. I do not think this claim can be made for any removable appliance, and it is sometimes of vital importance that the whole of the space obtained by an extraction shall be reserved for the front teeth. I will explain later on the essential details to ensure this result.

Rotation of the incisors is possible with plates, but how much simpler this operation is with fixed apparatus, and what can be done with canines, premolars and molars unless we used fixed appliances?

#### JUMPING THE BITE.

I know some workers manage to treat "post-normal occlusion" cases with removable appliances, but they have not been successful in my hands. I believe the great majority of these cases can only be treated successfully with intermaxillary traction.

#### DIFFICULTIES.

Turning now to the difficulties, I have tried first of all to remember all those which I have had worry me in the past, and which I feel I have solved or at any rate partly conquered, and I am going to tell you just what I believe is the best thing to do. The chief difficulties are due to the fragile nature of these appliances, and the fact that they are easily broken or bent out of shape.

I really believe if you can persuade your patients to give up eating toffee you will have got a long way in avoiding breakages. I always forbid my patients to eat toffee on pain of incurring my severest displeasure. When a fixed appliance breaks it usually means an immediate visit to the dentist, or failing that, a frantic attempt on the part of the patient or parents to remove the remaining part of the apparatus. This removal is usually accomplished at the expense of further damage to the apparatus, waste of time and a set-back to the course of treatment. I will take these breakages in the following order: bands, body wires, spring wires.

But before proceeding to enumerate the pitfalls to be avoided, I want to say a few words on the necessity of proper tools in the fitting of bands. If anyone decides to try fixed appliances, I consider he would be wasting his time, and be quite unable to obtain the best results, unless he makes use of a few simple but invaluable tools which are made specially for orthodontists. I



stress this because, without them, the dentist is at a disadvantage, and almost certain to get unsatisfactory results, which may discourage him and possibly give him an entirely wrong idea of the possibilities of these appliances.

### TOOLS.

There are two absolutely essential tools :

(1) Mershon's band-pusher.

Don't tell me you have an old gold-plugger which does "just as well," because if you do I shall be quite sure you have never used a real band-pusher ! The amount of force, which it is necessary at times to exert on a band, far exceeds that ever used in gold-plugging. The serrations on a gold-plugger are quite unsuited for the edge of a band. So if you decide to put on a band, you must make up your mind to buy a proper pusher.

(2) The next absolutely essential tool is a *band remover* (Case's pattern). Don't imagine you can save anything by doing without one. You can't ! During the fitting of a band it will be necessary to remove it half a dozen times at least, and a band remover does it in a moment. Once the band is cemented the only practicable way to remove it, without mutilation, is by a proper band-removing plier.

These two I consider cannot be dispensed with, but there are others which save time and give better results. I will just mention and show a few :

(1) Band-making pliers (Angle's).

(2) Band-stretching pliers enable one to make use of a band which otherwise must be discarded as too small.

(3) Contouring pliers.

(4) Tungsten soldering tweezers (Julius Aderer's).

These are the most satisfying tools I have ever come across. They never bend or break or corrode. No solder ever sticks to them. They are a joy to use.

### ANCHOR BANDS.

Now about the bands. A band may become loose or it may break. The commonest cause of either is the use of unsuitable material in composition or strength. *In my opinion the use of German silver for molar bands is a sheer waste of time.* It lacks the strength and stiffness essential in a molar band where the forces of mastication are at their greatest. If you say the call for economy makes the use of precious metals impossible, then I should say, don't attempt the case unless it is one where the child is close at hand in the event of a breakage, or where the case is a simple one which will only take a few months.

### BAND MATERIALS.

Now what materials should be used ? Gold-platinum alloys, such as Dee's band material, gauge .006 and .180 width, or possibly .200 for molar bands. Whatever you do, don't be beguiled into using anything thinner. The thinner gauge is easier to fit—but

it is the easy road that leads to destruction ! A little extra time taken in fitting the stiffer material will be well repaid later on.

In making a band it is much better to have it too big than too small. If the band on a molar encroaches on the masticating surface and gets bitten up by the opposing teeth, it is bound to stretch and loosen. This most frequently happens on the lowers and is due to the band being too high up on the buccal surface. If the band is too small when first soldered, it may be stretched by suitable pliers, but do not carry this too far. A stretched band is a thinner band, and may lead to trouble. It is far better to have a band which is a loose fit than one which doesn't go quite far enough. The cement will fill in the space. Next, be sure the rim of the band fits the tooth snugly at the masticating surface. To shrink the top edge of the band is quite simple if one nibbles along the edge with a smooth-beaked plier (such as Peeso's crown and bridge pliers), bending the edge inwards and working round and round till the desired amount of shrinkage has been obtained. If necessary cut the edge of the band and overlap the cut surface and solder together.

*Cementing.*—A real good hard cement (such as Ames' crown and bridge) must be used, and, most important of all, the tooth must be clean ! I find the use of Taxi most satisfactory. It leaves a beautifully clean surface free from all deposits, on to which the cement sticks like glue !

To repeat. For a satisfactory anchor band you must have :

- (1) A thick, stiff material.
- (2) A big enough band.
- (3) A snug fit on masticating edge, and
- (4) A clean tooth surface.

Do bands ever hurt the enamel ? Yes, they can do so, but only in cases of neglect. It is many years since I had anything of that sort happen, and the way to avoid it is simple. Always examine the bands critically with a fine probe, and see if there is any sign of the cement washing out at the edge. If so you may be pretty sure there is loosening going on, and you should get your band removers and have it off. A good general rule is never to let a molar band stay on more than nine months. Incisor bands, six months at the outside. Then, however firm they seem to be, remove and re-cement. I only once remember seeing any decalcification caused by an arch. That was in a case where the patient, a girl who was particularly careless about her teeth, went away with a lot of ligatures on the incisors, and I didn't see her for nearly six months. There was a white decalcification above the labial arch on all the incisors. After five years they have not decayed, but are unsightly.

#### BODY WIRES.

The arch itself is liable to break, and when this happens the commonest place is close to the attachment. I believe this is caused by the patient getting the tip of the tongue under the front of the arch and playing with it. To prevent this a band should be placed on at least one of the six lower teeth with a spur on the



lingual side under which the arch can be locked into place, and so prevent the tongue lifting it up.

#### FINGER SPRINGS.

The next most usual difficulty is the displacement or bending of the finger springs. It is no use sending a child away to school with complicated finger springs unless you know there is a dentist who can attend to it at the school end. Only the simpler forms of appliance can be used with confidence that treatment will go on uninterruptedly. These delicate wires must be adequately protected from the strain of mastication by being placed beneath the body wire, and the free ends prevented from coming up by small wires soldered to the arch at right angles, called spring stops. The weakest part of a finger spring is at the soldered end where it has been heated, and it is just there that the strain comes. To avoid fractures at this point, I find the most satisfactory way is to solder, and then make two complete turns round the arch before taking the finger spring wire to the point of action. This greatly reduces the strain on the soldered joint and adds enormously to the springiness.

#### RETRACTION ARCH.

I think the simplest and most common use for a fixed appliance is in the retraction of the upper incisors and canines in cases where the first premolars have been extracted. Nothing in my experience works so smoothly and surely, and with so little need for attention, so that a child can be sent away to school with the confidence that, barring accidents, the treatment will be continuous during the term time. It is this absence from the dentist that makes me emphasise the importance of using bands which won't come off. If the patient is going to be closely under your care, a broken band only means the annoyance of replacing it, but away at school a breakage may mean several months of treatment lost. You are all familiar with this application of the plain retraction arch with elastics for the motive power. I want, however, to stress certain points which are sometimes overlooked.

First of all, the pull on the posterior teeth will cause them to tip forward and encroach on the space obtained by the extractions, unless we very definitely take steps to prevent it. This is simplicity itself. You must proceed just as though you were trying to tip the molars backward. First of all, solder clips on the arch which will rest on the incisal edges of the centrals. Bend the arch so that when it is at rest it lies at the neck of the incisors. Then spring it down and let the clips rest on the incisal edges of the centrals. The apparatus, left to itself, will now tilt the molars backwards. But when we put on the elastics their forward pull tends to counteract this movement.

The only possible movement now for the molar anchor tooth is bodily through the jaw, which as you know is almost impossible, so that we have a practically immovable anchorage, and all the front teeth can be moved back with the molars still in their original position. It is quite possible actually to tilt the



molars distally while using them to pull the incisors back. So stable is this form of anchorage that if by any chance the first permanent molars have been lost, one can use the second premolars for retracting all the upper teeth without these comparatively weak teeth coming forward. I have models showing such a case on the table.

Resting these incisal clips on the centrals has a distinct advantage. These teeth are quite frequently too long, and the pressure from the arch is sufficient to push them up into the socket ; so much so that I frequently find it necessary to put spurs on the laterals as well, to prevent the centrals going up too far.

#### LIGATURES.

If ligatures are necessary, I use the thickest wire possible and take the precaution of twisting the free ends completely round the arch. The great thing is to secure the ligature so that the tooth-brush cannot loosen it.

I never now use ligatures for a patient who is going away to school—unless I know there is a dentist at hand to attend regularly to the case. I think that as time goes on I am becoming more cautious, and do not attempt any but the simplest cases unless they are under my eye all the time. I have learnt from very annoying experiences that a broken appliance away at school can cause more trouble than it is worth.

I really must ask you to excuse the elementary nature of these remarks. I only hope that for some of the younger members they may prove of value. I agree with Mr. Cale Matthews, who in his recent paper made a plea for practical instruction. There's nothing like a practical demonstration. But I hope that even by the spoken word I may have conveyed something of practical value.

As I said at the beginning of my paper, we are greatly handicapped, but I hope I have convinced you that, despite the difficulties, there *are* possibilities, even in this country, for the use—and highly satisfying use too—of fixed appliances in general practice.

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### THE POSSIBILITIES OF, AND DIFFICULTIES ASSOCIATED WITH, FIXED APPLIANCE WORK.

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By NORMAN GRAY, L.D.S., H.D.D.

WHEN my partner and I were asked to write this joint paper, it was decided that I would try and point out some of the possibilities and difficulties which affect the patients rather than their appliances ; and so quite naturally it is my lot to speak more of problems and difficulties than possibilities. In the main, I propose to leave the possibilities of the fixed appliance to the judgment of my hearers.

Fixed appliances are legion. My experience only allows me to speak of the simple Mershon technique and not of the multiple banded apparatus (which is fixed in the real sense of the word). Amongst the obvious possibilities let me briefly remind you again of the seemingly unlimited movements one can obtain with the



variations of these simple arches, of the delicate pressures continued long after the adjustment, and that visits for adjustment can be relatively infrequent. Appliances of this type make it possible for the patient to be away for long holiday periods or for the whole school term. We know that these gradual movements tend to be more permanent, and that retention is thereby frequently avoided.

So much for possibilities. In life the problems usually come before we get through to the possibilities, and so one feels that a paper about difficulties will be more practical. One of the first difficulties is to explain the possibilities of the fixed appliance to parents or guardian of the prospective patient. Children often come with pain and the orthodontic problem may not have been noticed. So frequently do adults exclaim at defects overlooked in childhood that I always make an effort to get in touch with parents or guardian in order to point out the abnormalities and the problems it may cause in adult life if overlooked. Very often the parents are abroad, but if for one reason or another I have been unable to see them, I follow the matter up with a short letter when the accounts go out. I briefly outline the matter of the account and then mention the orthodontic problem in case it has been genuinely overlooked. It saves me being shouldered with the responsibility of neglect, and it shows my interest in the child. If further correspondence ensues, I ask for one of the parents or a trusted relative to come at half-term or a school function to talk the matter over with me, as this saves the misunderstanding of letter-writing. I find it much easier to explain the possibilities of treatment by comparison with models of past cases similar to the case in hand, by diagrams, and by models of actual appliances. If the patient is the mouth-breathing type, I have a collection of full-face and profile photographs of old cases before and after treatment. When once a parent can see and handle the problem under discussion, and has the opportunity for comparison with similar cases, the difficulties and possibilities are more readily grasped than when merely talked about or written about, and ever afterwards they co-operate more satisfactorily. Words are such empty things to play with, and the mental picture of the parent is often amazingly different from ours if we could but know it. Of course this method applies to all forms of orthodontic treatment, but the fixed appliance is particularly difficult to explain without models. If my hearers have collected a demonstration museum of this sort, they have gone a long way towards solving the first problem, and the visit gives an opportunity to discuss the elementary principles of growth and development, together with nutrition, oral health and hygiene, as well as the subjects Dr. Martin Dewey groups together and aptly calls "Preventative Orthodontics."

So far so good. The next problem more peculiar to fixed appliances is the nervous small child. Not the *very* young child with only deciduous teeth present (I doubt if any orthodontic appliance is advisable for such very tender years), but a child of seven or eight years. One can take a compound impression readily enough and insert a plate which the child will wear quite cheer-



fully, but the fixed appliance is a much more difficult affair. In such cases I find it eminently helpful to make a special point of the child rather than the parents. I address myself exclusively to the child and never attempt any form of treatment until I have induced my patient to take an intelligent interest. Again I find it extremely helpful and interesting to the child if one shows models of old cases before and after treatment, helped with suitable photographs, and fear goes as interest comes. Talking to the child I find the parents are interested too. As a starting point I usually make a chart of the mouth and talk about maps and geography, and point out some of their own prominences and landmarks. Sometimes I make a few measurements with callipers; another time I ask my partner to photograph them in the drawing-room. They didn't expect that at the dentists! I can then point out that whereas the drill *was* a bit beastly and stung, making bands and arches, etc., will never hurt. It will only be like making wedding rings, and would they like to come to the surgery bench and watch me make them. I have not yet met a case in which one could not ultimately overcome the child's fears and make the little patient genuinely interested.

If the first appointment is spent in collecting data of the case it is not waste time, and the next visit usually produces a little patient brimming over with self-importance and keenness. Plaster impressions are usually the first step, and a somewhat messy and choky business can be rather fun if the child co-operates. I have plaster models of lips and noses and funny faces. I let them watch with a looking-glass and afterwards we fit some of the jigsaw pieces together. The majority of children ought to leave the surgery quite sure that the treatment does not hurt and that it is not bad fun.

Similarly with the next stage, the fitting of bands, a nervous child will be tremendously relieved if a few of its endless "whys" are satisfactorily answered. An explanation is given to help the child co-operate—one must judge whether the child is merely doing it to waste time.

As much as possible avoid heavy pressures by use of separating wires, by allowing bands to remain *in situ* for some minutes, by co-operation of the child in biting the band down with orangewood sticks. Even so one runs up against badly shaped teeth, bad fillings and advanced caries. These points together with the temporary impaction of the second molar are touched upon by my partner in his paper.

Another problem peculiar to fixed appliances is the school appointments. In the early stages half a dozen long appointments are required and I find it best to state this frankly to the school, asking for special concessions as regards times. Quite rightly one needs to be fresh for this work, and have the best part of the day for it, so the appointment-book must be kept clear for the purpose. One can readily promise that subsequent visits will be relatively infrequent and easily adjusted to set time-tables.

Another series of difficulties is the problem of the broken appliances, upsetting to the patient, the school and the dentist. The removable appliance can often be sent satisfactorily by post



for repair, but not a fixed appliance. Sometimes it is entirely the fault of the patient, but quite as often the fault of the dentist. It is very important to know which is to blame lest one discourage or frighten young children. I never charge a fee for broken appliances on this account unless broken or lost through gross carelessness.

*Appliances break through :*

Caramels.

Overheating.

Finger springs.

Age of appliance.

Heavy bites.

Pain.

Medical intervention.

Careless and thoughtless patients.

Before the appliance is first inserted the patient is warned that the mouth will be a little uncomfortable for twenty-four hours, but that this will soon pass and should not trouble him again. Patient and parents are told that if anything ever breaks I am to be informed at once, and all parts are to be kept carefully ; also that no parts must be removed save in exceptional cases. I ask them to promise me not to eat *caramels* and sticky sweets, and advise the parents to assist by sending hard boiled sweets as a counter-attraction. In the case of a labial arch in boys, I tell them if they do any boxing that it must be stopped for the present.

With regard to *overheating*, this is generally avoidable by careful laboratory technique.

*Finger Springs.* These are a fruitful cause of trouble. Avoid them as much as possible. Many of the tooth movements may be obtained by the body wire itself. Kinks may be put into the arch which can be straightened out, and this will cause adequate pressure in most of the desired directions. Finger springs tend to lift the body wire up from the lower jaw and down in the upper jaw ; sooner or later this causes the breakage of the spring or of the body wire at the D-tube attachment. When a spring has to be fitted it should be coiled round the body wire two or three times after soldering. This improves the temper of the spring and protects the weakness of the soldered joint.

*Age of Appliance.* With the precious metals the same appliance can be used for a very long time, so this must be safeguarded by the regular annealing of the arches, and the periodical inspection of the bands.

*Medical Intervention.* This is an occasional difficulty during illness or prior to an anæsthetic, but a very trying one. I have had finger springs cut off, arches forcibly torn out of the mouth. A warning can be given about this in a preliminary talk, and the instruction will vary with the type of appliance.

*The careless and thoughtless boy or girl* is my greatest difficulty. It is a great help if one can spot them beforehand as then one can ask that a large proportion of the fee be paid early in the proceedings. This is not greed, but definitely tends to make parents and school co-operate seriously. A simplification of the appliance is essential in these cases, and a serious talk should follow



each misdemeanour. If after repeated efforts with alternative types of appliance the child remains incorrigible, it is better to wash one's hands of the case.

When the appliances have been inserted I have found it a good plan to stress the renewed importance of the tooth-brush and dental tape. It is better to do this when the child is alone; if the patient thinks it is done at the parent's instigation, he will not be over-impressed, but a pally "man-to-man" talk is very impressive. Similarly, as Sir Norman Bennett pointed out, it is very important to make the child responsible for the appliance rather than the parent. I do this in a number of ways. Intelligent children may be taught to remove labial arches for cleaning; they will readily appreciate how important it is that they should not get bent and why. If the new labial arch is impressed in a tablet of warm modelling compound, this will make a safe receptacle for the arch, and the interested child will notice any distortion immediately. If rubber elastics are used, the child writes direct for a further supply when he runs short, and these I send by post to him personally with a note.

Please do not imagine from this paper that I claim complete success with all my cases, but I have found these methods help me to surmount most of my problems, and we all know the joyous sense of achievement if we can win the confidence of a little child and teach him to help himself in a later day. I trust that my remarks will lead to a helpful discussion. If I can do this, the paper will have been worth while.

#### DISCUSSION.

Mr. F. J. DOWNING, speaking on the question raised by Mr. Visick as to fixed appliances, said that he still preferred movable appliances, especially when retracting upper incisors after taking away the first pre-molars. He agreed with Mr. Visick as to the nuisance of toffee-eating. Mr. Gray had mentioned that when a child was absolutely untrainable with appliances it was just as well to relinquish the case. Another member mentioned that he had not experienced trouble from the breaking of ligatures since using stainless steel ligature wire, which seemed to stand up to the requirements remarkably well.

Mr. MARSH said that he had been puzzling over the diagram shown by Mr. Visick on the blackboard, and he had so much respect for Mr. Visick that he felt sure that what he, Mr. Marsh, thought was the case, could not be right. But, as Mr. Visick had said, they all knew that if the appliance were used in the way Mr. Visick had drawn it, and made the molars the anchorage by which to pull back the arch, these anchor teeth would move forward. Mr. Visick then bent his arch upwards and brought it down by means of the catch at the tip of the incisor teeth, and so created a force which drove the occlusal part of the molar backwards and enabled it to pull the arch backwards without itself being pulled forwards. It seemed to him that one force must counteract the other. Yet Mr. Visick stated that that was not so, and the anterior teeth were retracted. If that was the case, all of them to whom it was new had learned a very great deal. He had been for many years making use of intermaxillary traction, and using the tubes on the buccal surfaces of the lower molars for the elastics in these cases. Mr. Visick did not say anything about the fixed appliances which he used for rotation, and many of those present would like him to say something about them. He himself had found extremely useful



the auxiliary spring attached to the labial arch—the spring and band as Dr. Jackson had shown at the International Orthodontic Congress.

MRS. POSSENER MICHAELIS, following upon what a previous speaker had said about the child who was “washed out” from other practices, suggested that probably 99.9 per cent. of the children who came as “impossible” patients had been made impossible by a dentist somewhere. She believed quite firmly that any child could be handled, if he was handled correctly in the first instance. It was the first stage that was the most important. It was just a question of finding out what it was that had scared the child, and of wiping out the scare. The question of fees had been mentioned, rather tentatively, and she desired to ask whether, in treating an orthodontic case, the mouth as such should be treated, or whether one should treat the like condition as such. She herself favoured a scheme which was designed to encourage people who were rather frightened of orthodontics. If she was treating a patient orthodontically she did any work which might be necessary during the period of treatment. If, for example, the treatment was going to last three years she did any work which might be necessary during that period without sending in an additional account. That was quite an interesting point for an orthodontist who was not a specialist.

Mr. J. H. BADCOCK, pointing to the instruments which Mr. Visick had exhibited, said that he was almost ashamed to admit that he himself had been able to fit his molar bands without any such tools. He had done so by using the finger and a piece of wood. He did not think that anyone need be put off by the feeling that a number of special tools were required. With regard to the material of the bands, he agreed with Mr. Visick that precious metal should be used, but there again, if expense was a very material consideration, he thought one could do without it very largely. In that case he would advise the use of Blue Island band material, which was possibly a sort of German silver, but of a particularly soft kind and very easily moulded to the shape of the teeth—more easily, really, than precious metal—as well as able to stand up for quite a reasonable length of time. With regard to the fitting of the bands, if one snipped the edges of the band it was very much more easy to fit, but he went further in this respect than Mr. Visick had done. Mr. Visick made two or three nicks, whereas he made nicks all the way round—a sort of fringe—and with his despised gold plugger he pushed down one section after the other, only slight pressure being necessary, so that he did not have to push hard and frighten the child. He had been rather surprised to find that a number of people did not seem to know about the apparatus for extracting the upper front teeth that Mr. Visick had described. Nothing could be more efficient or foolproof, and he personally had used it for at least twenty years. He placed the utmost reliance in it. He used clips not only on the centrals, but on the laterals too, because there was always a tendency to shorten. He adjusted the appliance so that it just touched the teeth to begin with, and he found that those teeth began to shorten. Then he took his arch off and bent it slightly, and in that way he got exactly the amount of shortening desired according to the pressure put on. He put it on the four incisors so that they all shortened equally, and as one drew them back one pushed them up. Various speakers had mentioned the canines. His practice was to pull the canines back at the same time as the incisors, but he always gave them an extra pull because they were harder teeth to deal with. He banded the canines separately and put a little hook on the canine band and used an added elastic. This he found very satisfactory. That brought him to another small point. He always cast the canine bands instead of making them in the ordinary way with band material. He took an impression in a copper ring with a little composition and cast that in cement. It made a perfect



fit, giving no trouble, and sticking very well indeed. The whole thing worked automatically, and there was no worry about it, and practically no possibility of failure.

Mr. CATCHPOLE said that he had been hoping Mr. Visick would have explained one further trouble which he himself seemed to experience. He found that when he had a lingual arch in the upper and lower, the lower jaw often seemed to go to one side for some reason or other. He had been unable to decide why this bias occurred, but certainly the patient seemed to be biting to one side.

Mr. ROBERT CUTLER (Hon. Secretary), said that all members must agree that the inaugural meeting in the Society's new headquarters (Mansion House) had been very ably supported by Messrs. Visick and Gray with their papers. The subject was of perennial interest to them, because at heart the best orthodontists were essentially mechanics, and the mechanical possibilities of fixed appliance work appeared endless. It had long been known that Mr. Visick and Mr. Gray were keen propagandists of this system. The Society had listened to their views with considerable interest, more particularly as many members were aware of the technical quality of Mr. Visick's work in other spheres, and they could not doubt the sincerity of the opinions the authors had brought forward. Possibly the authors were particularly fortunate in that their patients were so largely under their supervision and control whilst at school, so that the maintenance of these delicate fixed appliances was very easily effected. In London, those who practised orthodontics were less fortunate in this respect, and often had to bring about their results by means of less elegant, but not less utilitarian appliances. It was a far cry from orthodontia to a discussion upon the teaching system in this country, but to his mind it was extraordinary how the average English parent, as he found his child growing to an age of rational intelligence, particularly susceptible to external ideas and environment, and most likely to benefit from parental experience, dispatched him forthwith to some teaching institution, as far away as possible, where he was moulded into some standardised pattern, the virtues of which were sometimes a little difficult to discover. It was the price that had to be paid for the comforting reflection that so many famous battles had been won on the playing fields of certain schools. From a technical standpoint the case for fixed appliances could well be argued. For instance, Class II, Division II, cases, with excessively close bite, were infinitely better treated by means of a removable appliance. Mr. Visick and Mr. Gray had in no way touched upon the question of excessively close bite, which wrecked so many cases. It seemed to him that in the appliance Mr. Visick had described that evening, he had not touched on those many cases of Class II, in which very close bite was also present, and in respect of which the most trouble was in connection with the cure and control of the excessive incisor overbite. Taking the very case which Mr. Visick had described and illustrated on the blackboard, he wished to ask him how he controlled the excessive incisor overbite while retraction was going on. Many of these Class II cases had very close bite indeed. One did very often treat them on palliative lines by leaving the jaw in its shortened state and getting harmony in the two jaws, extracting in the upper and retracting, but before that was done one had to abolish the excessively close bite. Mr. Visick had raised an extremely interesting point when he spoke about the breakage of arches and said it occurred near the attachment. In stainless steel appliances that occurrence had been noticed. The stainless steel arches tended to break at a point (indicated with reference to the diagram on the blackboard) where they were nowhere near any point of bending in the arch. That point was one on which the pliers never went. With regard to the annealing of arches and the breakage that occurred in finger springs, with these platinised gold appliances the



Americans seemed to attach great importance to the question of the subsequent tempering of the appliance. He supposed that when the appliance was made and was quite passive it was treated with acid and tempered by being heated to a red heat and then cooled. The Baker people employed a special sort of tempering pot, and they said that the higher the platinum content the more critical did this tempering become. Some people seemed to think that fixed appliances were more in accord than removable ones with the natural processes of growth. The speaker did not think that was the case. The psychological points on which Mr. Gray had touched were extraordinarily interesting, more particularly as concerned the mental picture that parents had regarding their children's deformities, which was so different from the picture formed by the orthodontist. He remembered, a few years ago, being introduced to a young woman who had a rather marked Class II deformity, at which, as an orthodontist, he was horrified; otherwise she was a good looking person of twenty-two. But a year later she married a relative of his own, and since then he had seen her frequently, and now he could tolerate quite well that gross deformity. That was obviously the point of view of parents, and to the extent that they regarded such deformities complacently they did not take too kindly to the energetic measures which orthodontists proposed on their children's behalf. If the same care and time and trouble were put into the fabrication and subsequent adjustment and manipulation of removable appliances there would be very little to choose as between the results obtained with removable and with fixed appliances respectively. It was the end of the journey which mattered, and if some people liked to go down to—say—Eastbourne in a Rolls Royce, others could accomplish the journey equally safely and quickly, though perhaps not equally comfortably, in a small mass-produced motor-car of low horse power, such as so many of the junior members of the Society, amongst which he numbered himself, had perforce to be content with.

Mr. VISICK, replying to Mr. Marsh and Mr. Downing, said he used to pull back the canines first as a routine method of treating these cases, but with further experience he found it unnecessary to do so; this was possibly because he was treating these cases much earlier, often before the canines were fully erupted, and one got the incisors back and the canines down into place. Even if the canines were fully erupted, they would go back perfectly well with the incisors, but one must not be in a hurry. Some of his best results had been obtained in cases where the patients had stayed away unexpectedly, and months afterwards he had been astonished at the improvement that had taken place. Care should be taken to see that the arch did not cramp the canines.

He next spoke of the question of keeping back the molars, to which Mr. Marsh had alluded. The whole point was to make sure that the molar was a really fixed anchorage. If the band and arch fitted to the molar were all in one piece and absolutely rigid, this would be accomplished, but as the arch was not always a dead fit in the tube there was a certain amount of movement there, which would allow the molar to tip forward. By putting a slight amount of spring in the arch one counteracted that movement and the molar became a really fixed anchorage.

Mr. MARSH: It would not pull the front teeth back unless it came forward.

Mr. VISICK replied that it probably did come forward, but the movement was too slight to be seen. He had met many cases where there were no clips on the incisors, and all that he knew was that those molars were going to tip forward. It was a case of pitting two forces one against the other. The reason why he did not like intermaxillary traction in these cases was because it was more complicated. The



procedure he had indicated had the advantage of simplicity. With regard to rotation, he often used just a band and spur on the rotated tooth, and he still used a ligature.

Mr. Badcock had spoken about his tools. A really skilled worker could make almost any sort of tool do the work. But he had had tremendous satisfaction in using the band pusher and band remover. He did not like to see a band with a lot of nicks cut in it and soldered up. They made the band clumsy and stiff. He liked the idea of the cast band on the canines.

With regard to Mr. Catchpole's difficulty with the lower jaw going to one side, he thought this was because the arch was not properly adjusted. The only thing was to put in an extra elastic band on the one side.

With regard to close bite, he used to treat these cases by putting in a bite plate for six months, and then, when he had got about one-eighth of an inch between the lower incisors and the uppers, he used a plain arch to retract the incisors. But of late years he had often dispensed with the preliminary bite plate, and found that as the upper teeth came back the bite seemed to adjust itself to the new position, the cingulum of the upper incisors acting in the same way as a bite plate on the lower incisors.

Mr. Cutler's allusion to the breaking point was interesting. Mr. Visick thought the metal broke at the point he had indicated because it was there that the bending took place, and the metal became tired and crystalline. That was why he advocated a band on a lower incisor to prevent the arch being lifted up and down by the tip of the tongue. With regard to the tempering, he liked to have the temper on the soft side. As to the respective merits of removable and fixed appliances, he could only say that he had found the appliances of which he had spoken infinitely superior in his hands to the removable appliances.

Mr. GRAY, who also replied, agreed with Mrs. Possener Michaelis that one ought to try and find the cause that had scared the patient. If that were known, it was always a great help. He had found it advisable to go gently with patients at first by trying to interest them, and once the interest was gained, they became faithful patients ever afterwards.

With regard to the matter of fees, this had only been mentioned as a factor in stimulating the co-operation of the parents. In the paper Mr. Gray mentioned sending patients away, but he only recalled one boy with whom he could do little or nothing. This boy was so hopeless that he had been asked to leave his preparatory school, and later on had been expelled from the public school. Such a boy would tax anyone's ingenuity to the fullest extent.

The vexed question of fixed *versus* removable appliances had been mentioned by several, but as the Society had asked for a paper on fixed appliances the removable appliances did not come within the scope of the paper. As to which interfered least with natural growth, he thought that fixed appliances could be made much smaller and the pressures more gradual than with the removable appliance, and these movements were more in accord with the normal processes of growth and development.

A MEETING of the Society was held at Manson House, 26, Portland Place, W.1, on Monday, November 7th, 1932, Mr. CARL SCHELLING (President) in the chair.

The SECRETARY (Mr. ROBERT CUTLER) read the minutes of the previous meeting, which were confirmed and signed.

The following candidates were duly elected: F. H. Salter, L.D.S.,



D.D.S.Penn., 85, Wimpole Street, W.1, R. A. Glindon, L.D.S., R.C.S.Eng., 56, Welbeck Street, W.1, J. R. Ritblat, L.D.S., R.C.S.Eng., 29, Worple Road, Wimbledon, R. G. Daplyn, L.D.S., R.C.S.Eng., Eastman Clinic, Gray's Inn Road, W.C., G. W. Royle, L.D.S., R.C.S.Eng., 3, Goldington Road, Bedford.

The PRESIDENT said it was his sad duty to refer to the death of Dr. William Fisher, who was president of the First Orthodontic Congress in New York in 1926. He had come over here to attend the Second Congress on 1931, but was taken seriously ill, and could not be present at the meeting. Dr. Fisher was one of the most energetic promoters of the congresses, and was responsible for much of the success of the Second Congress in London.

A vote of condolence with the relatives was passed in silence, members standing.

The following communications were read :—

Mr. F. B. BULL :

**“ Cases of Practical Interest.”**

Mr. HAROLD CHAPMAN :

**“ A Note on Extraction in Orthodontic Cases.”**

Mr. F. L. KING :

**“ A Case of Impacted Canines.”**

**“ A Case of Missing Laterals.”**

Mr. A. C. R. McLEOD :

**“ Incisor Tooth Deficiency in Three Generations.”**

Mr. F. STEADMAN and Miss K. C. SMYTH :

**“ Some Cases of Lingual Relationship of Lower Molars.”**





## A NOTE ON EXTRACTION IN ORTHODONTIC CASES.\*

By HAROLD CHAPMAN, L.D.S.

DURING the past year several people have said to me: "You have become an ardent advocate of extraction as a part of orthodontic treatment." I do not regard that as a correct designation; probably it has arisen from an incomplete study of what I have written: it would be nearly as sensible to describe me as an inlay worker because I have advocated the use of gold inlays for anchorage for bows, in suitable cases, instead of bands; probably I am more in favour of extraction to-day than I was fifteen years ago, nevertheless, there are many cases that I think are better treated without extraction and many others in which I believe extraction is indicated. However, that is not the main point; extraction must of necessity play a large part in orthodontic treatment at the present time, and what I have been particularly concerned about is that when extractions are performed they will really be a benefit to the patient and not a detriment as is frequently the case.

There is considerable misconception in the profession about what and when to extract and this Society has an opportunity, through its large membership, to do valuable work in elucidating what may be the correct procedure in a particular case; the fact that an individual or this Society is investigating the subject, does not make him an "exodontist," but marks him as an orthodontist with a broad outlook, and one who is anxious for the welfare of his patients.

It is not my intention to discuss this question now; I did that at the demonstration meetings of this Society and the B.D.A., earlier in the year, but I do suggest that this is a subject—what and when to extract—in the investigation of which, every member of this Society may take a part. Many of the rules to be found in the literature are inadequately presented or are incorrectly interpreted if one is to judge by results, for I have seen not a few cases in which the extractions have not given the expected benefits; e.g., four first premolars have been removed when the removal of lower premolars is contra-indicated (Figs. 1, 2, 3 and 4); in other cases the removal of two first upper premolars is advised without further treatment though this would be necessary to bring about any benefit that the extractions might be able to confer (Fig. 5); the removal of lower incisors is an extremely difficult problem

\* *Transactions of British Society for the Study of Orthodontics*, 1932.





Fig. 1.—Example of removal  
of  $\begin{array}{c|c} 4 & 4 \\ \hline 4 & 4 \end{array}$ .

The extraction of  $\overline{4|4}$  is  
contra-indicated in this type of  
case.



Fig. 2. A.



Fig. 2. B.

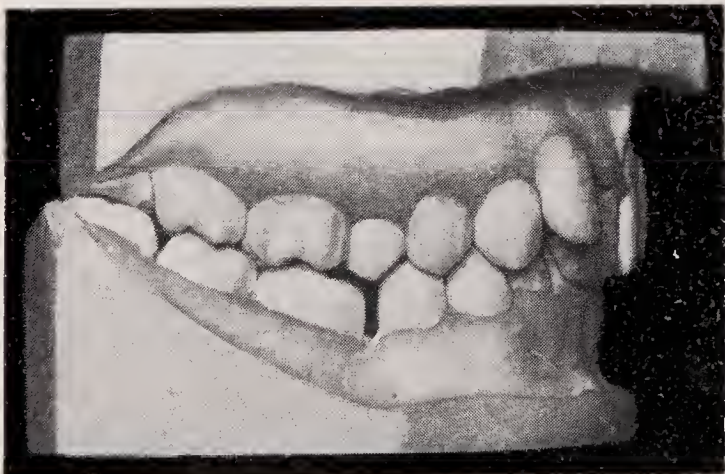


Fig. 2. A.



Fig. 2. B.



Fig. 2.—(A) Female, age 20-6,  $\overline{e} \mid \overline{e}$  extracted at about age 17;  $\overline{5} \mid \overline{5}$  have never erupted; loss of  $\overline{e} \mid \overline{e}$  in all probability has allowed the lower arch to become smaller and with it the upper arch would become smaller and accentuate the mal-position of  $\underline{2} \mid \underline{2}$ : were it possible it would have been better to have left  $\overline{e} \mid \overline{e}$  *in situ* in order that the size of the upper arch be maintained.

(B) a similar case, a girl, age 15-8 had  $\underline{2}$  very slightly prominent; at age 21-11,  $\underline{2}$  was considerably more prominent; its appearance caused advice to be sought;  $\overline{e}$  had been extracted in the interval (age unknown), which had probably allowed the lower arch to collapse and the upper one collapsed with it. In the interval  $\begin{array}{c} 8 \\ \mid \\ 8 \end{array}$  had erupted. At both periods  $\underline{c}$  was *in situ* and  $\underline{3}$  was lingually placed and almost horizontal with its crown close to the lateral root; it is not thought that this condition had any effect on the position of the lateral.

In another case\*  $\underline{1}$  was labial to the other teeth and at age 14 was getting worse:  $\underline{6} \mid \underline{6}$  had been lost or partially lost.

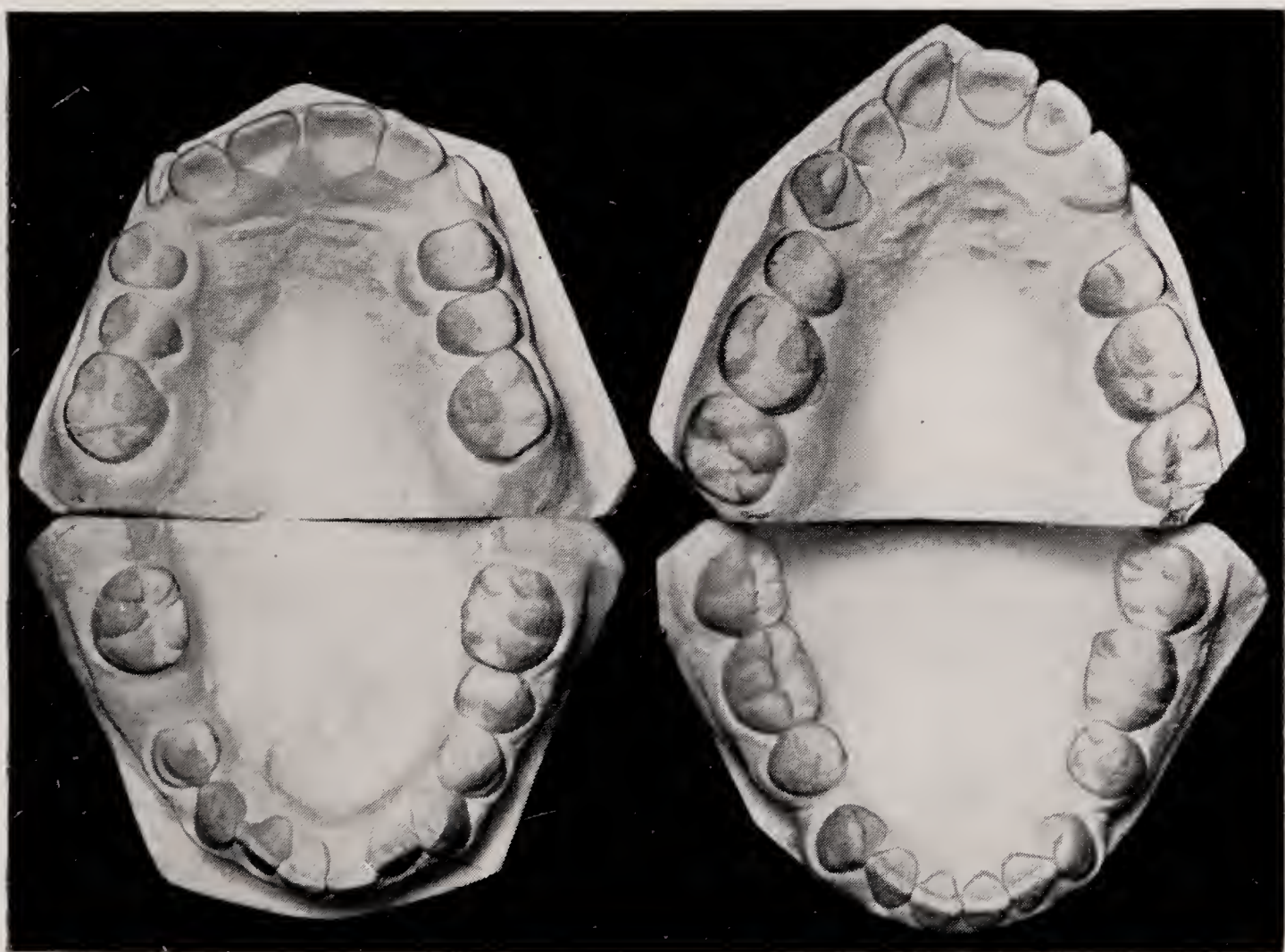


Fig. 3.—Another case in which  $\begin{array}{c} 4 \mid 4 \\ \mid \\ 4 \mid 4 \end{array}$  were removed. The condition five years later, during which time there was more or less continuous treatment was worse than at the beginning. The removal of  $\underline{4} \mid \underline{4}$  and retraction of  $\underline{3} \mid \underline{3}$  would have given a good result, as the incisor relations were satisfactory.

\* "Further cases illustrating the ill-effect on the upper arch caused by the loss of the lower teeth." *Trans. British Society for the Study of Orthodontics*, 1933.





Fig. 4.



Fig. 5.

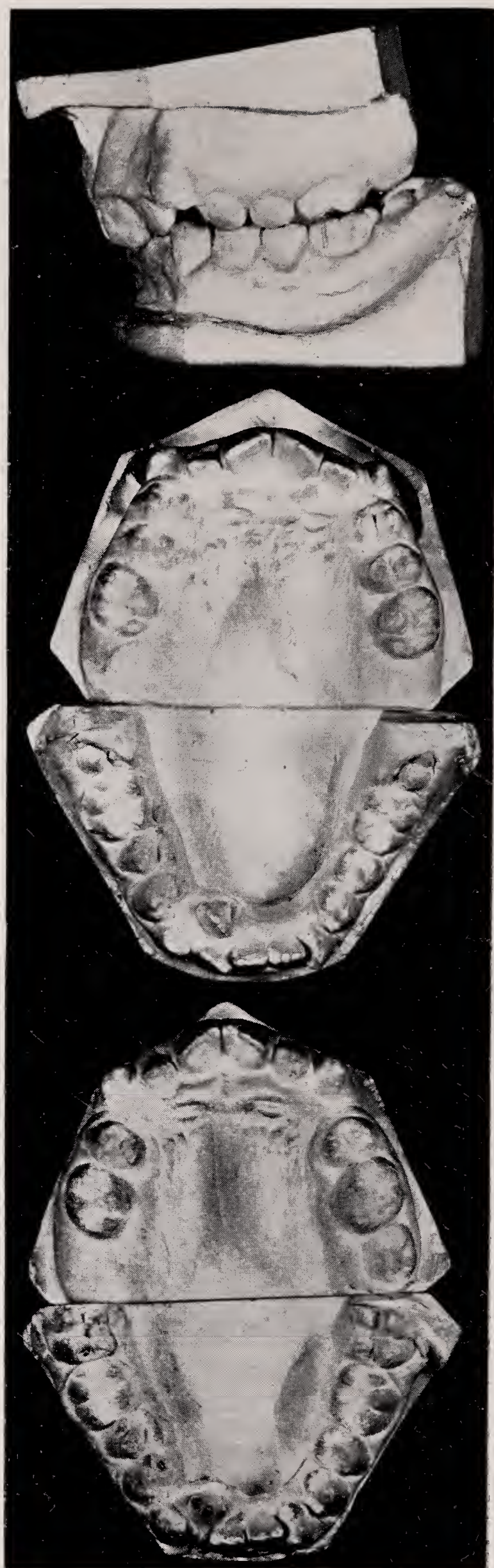


Fig. 6.



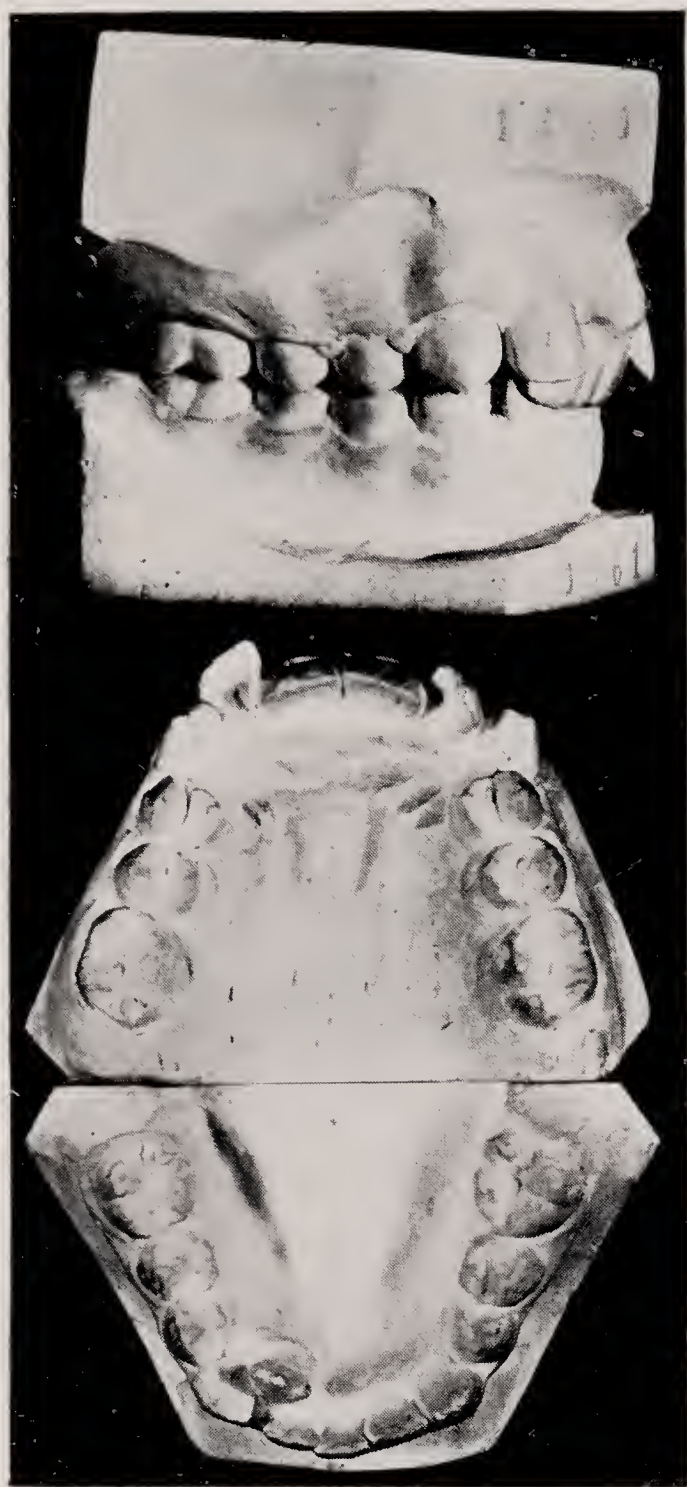


Fig. 7.

Fig. 4.—A Class II, Div. II case to be treated by removal of  $\overline{4} \mid \overline{4}$ : the lower arch is fairly good, but in any case a lower tooth should not be removed as this could not benefit the alignment of the upper teeth. The dentist in charge of the case wrote: "I thought it was quite usual to remove  $\overline{4} \mid \overline{4}$ , as well as  $\overline{4} \mid \overline{4}$ ." The right upper central is in good relation with the lower incisors.

Fig. 5.—The parents of this patient understood that removal of  $\overline{4} \mid \overline{4}$  would improve the facial appearance by "natural" lingual movement of the six anterior teeth. The position of the lower lip between the upper and lower incisors effectually prevented this occurring and the closure of the first premolar spaces took place by forward movement of the upper cheek teeth, not by backward movement of the front teeth. A lower incisor was also removed.

Fig. 6.—Removal of  $\overline{1} \mid$  at age 10-11. Closure of space one year later, so that there was insufficient space for  $\overline{2} \mid$ .

Fig. 7.—Removal of  $\overline{2} \mid$  at age 13-3. In a few months all the incisors and canines were in contact and further collapse of the arch prevented; probably it would have been better to have deferred the extraction until the patient was 17 years of age.

(Figs. 6, 7 and 8).—Treatment by extraction requires individual judgment both as to the tooth to be removed, the time when it shall be done, and the result to be achieved, but when treatment is by non-extraction, "normal occlusion" is the result to be obtained.

Again, the symmetrical extraction of the four first permanent molars is advocated without qualification and at times seems to be acted upon without any discretion (Fig. 9). In cases of post-normal occlusion the removal of any lower tooth is, as a general rule, contraindicated (Figs. 1, 2A and 4; exceptions, Figs. 6 and 7).



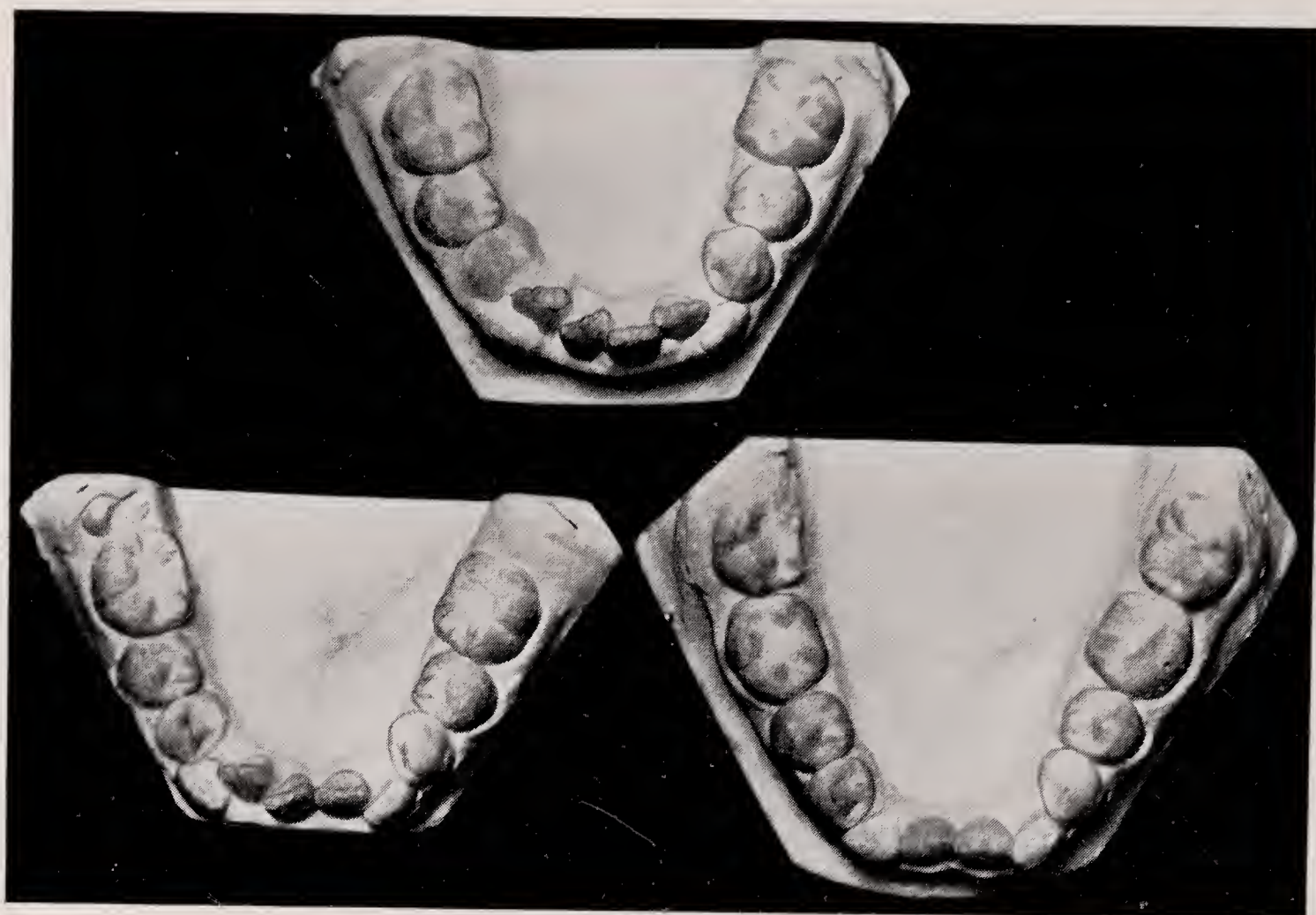


Fig. 8.



Fig. 9.

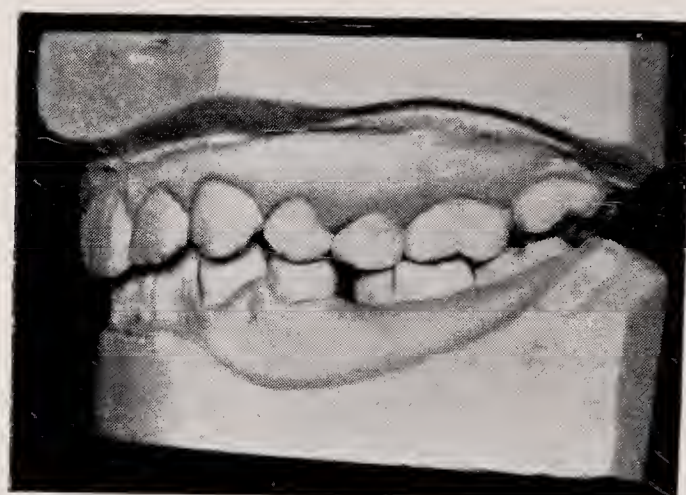


Fig. 10.

Fig. 8.—Extraction of a lower incisor at age 13-1, extraction of another lower incisor at age 13-6. After the latter further collapse of the arch had to be prevented by an appliance.

Fig. 9.  $\begin{array}{c} 6 \\ \hline 6 \end{array} \begin{array}{c} 6 \\ \hline 6 \end{array}$  removed at age 13-0. Spaces remained permanently between some of the cheek teeth, allowing food to wedge between them and cause discomfort. Relations of teeth satisfactory.

Fig. 10.—Closure of  $\overline{5}$  space, probably chiefly by medial movement of  $\overline{6}$  and some distal movement of  $\overline{4}$ . The cusps in this case are not well defined, but this does not seem essential for these movements to occur. The disto-lingual cusp  $\underline{6}$  occludes between  $\overline{6}$  and  $\overline{7}$ .



Nor is symmetrical extraction necessary to unlock the bite so that the teeth in one arch may move; the cases in which the posterior teeth do not move medially to close a gap, caused by the loss of an upper lateral or any tooth behind it, are extremely rare, even if the other arch of teeth is left intact (Fig. 10) and to do this may be and probably is, the better treatment.

All statements as to treatment need so much qualification that it is almost impossible for one to cover all the details that one has in mind: for example, at one of the meetings referred to above, an onlooker remarked that he had had good results from removing lower incisors; this at first sight seemed to point to a conclusion opposite that which I had formed, but on inquiring, he mentioned that such patients were, what I might term, "old" patients, say 16 or 17 years of age, and in certain selected cases I am inclined to think that this is a good time at which to remove a lower incisor, so long as the remaining ones need little or no mechanical treatment to align them (Fig. 7); another example is found in a paper by F. H. Gaunson\* in which the general principle laid down is to remove the four first permanent molars, but I would regard such treatment as exceptional as regards the cases I see: I have several where this has been done on account of caries and the probability that the teeth could not be kept for many years, but I would prefer removal of the first premolars if the condition of the teeth were similar.

I would like to see several evenings devoted to this subject; the removal of first molars might be discussed one evening, first premolars on another, and so on; cases being presented each evening by a number of individuals; there cannot be a member who could not take part in such presentations.

Figs. 1, 5, 6, 7 and 9 are taken from "The Science and Practice of Dental Surgery," edited by Sir Norman Bennett, 2nd Edition, by kind permission of the Oxford Medical Publications.

\* F. H. Gaunson: "The Case for Extracting the First Permanent Molars." *Dental Magazine and Oral Topics*, 1931.

#### DISCUSSION.

Mr. RIX said that in the two cases described by Mr. Harold Chapman, where the upper laterals were forced out in cases round about the age of 20, he wished to ask whether Mr. Chapman considered the possibility of forward thrust of the erupting eights in either of those cases. He had seen slight incisor irregularities come about at about the age of twenty when the wisdom tooth had erupted, and he had also seen cases which had been treated collapse at about that age, and he had often put the trouble down to the fault of those erupting teeth.

Mr. STEADMAN said he had been very glad to hear Mr. Chapman's condemnation of the somewhat common practice of extracting the two lower first premolars in addition to the upper. He had often extracted the upper first premolars, but the occasions when all the four could be removed, seemed to him rare; so often no good resulted but only harm. He did feel, however, as Mr. Chapman had emphasised, that at the age of 14 or 15, occasionally a lower central incisor might be removed in conjunction with the two upper first premolars.

Mr. WATKIN said he desired to ask Mr. Chapman a question as regards the case where one lower second deciduous molar was removed, whether an X-ray was taken to decide the presence or otherwise of the unerupted second premolar. It seemed to him that if it was known that the second premolar was absent, the result that occurred might be expected, and it would have been better either to leave the second deciduous molar alone, or to make a compensating extraction in the other dental arch. Another point as regards symmetrical extraction

was that in Class I cases where the molars were in normal occlusion and there was considerable crowding in the front, he found it very often useful and safer to take out the upper first premolars and the lower second premolars. If the four first premolars were extracted there was a risk of the remaining upper second premolars coming in front of the lower second premolars.

Mr. KING said he had been interested in Mr. Chapman's remark that the Society should undertake more study of these matters, and that there should be evenings dedicated to the particular teeth, and in particular that each member should enter more actively into co-operative study. He had brought with him to the meeting some models which he thought would illustrate those points which Mr. Chapman had been speaking about, and with the President's permission he would pass them round.

Mr. SAMUEL ~~DOWNING~~ said the Society should be very grateful to Mr. Chapman for his timely admonition. He always felt that practitioners were inclined to be rather phrase-mongers, and that certain phrases had rather misled them—phrases like “judicious extraction” and “judging each case on its own merits.” Some members had been inclined to rely on these phrases as the sum total of their practice. The question of the extraction of premolars in post-normal occlusion cases was one that was always being brought up in hospital practice. One constantly saw premolars removed in the expectation that the incisor teeth would travel back, which, of course, they very seldom did, though they did sometimes. The rule that had always guided him in extracting teeth was “Would extraction alone give a good result?” If an appliance was likely to have to be used subsequently to the extraction, then he had tried to do without the extraction.

A MEMBER said he thought the pitfall that ~~Mr. Downing~~ had mentioned might very well be turned to good account if everybody observed that excellent rule of having radiographs made of every patient presenting for orthodontic treatment. That should be part of the routine in these days. If a parent was prepared to spend any fee at all on the regulation of his children's mouths, it seemed to him that the taking of radiographs should become part of that fee in the course of treatment. It was not a question of considering the extra expense involved, and in hospital practice it most certainly should be done as a matter of routine, for the simple reason that hospitals were there to teach students how to do their work—at least, incidentally!

Mrs. MICHAELIS said that as regards the question of X-rays it did not appear to her that there could be any question, because quite apart from the point of finding or not finding premolars it was an impossibility to commence treatment in orthodontic cases without finding out whether there would be a supernumerary tooth there.

Mr. VISICK said that in listening to Mr. Chapman's talk it had struck him how extraordinarily the upper jaw was influenced by the lower. In so many of Mr. Chapman's cases teeth were extracted from the lower jaw, and the result in the upper jaw was very marked. The longer he practised orthodontics the more he realised the sort of fluidity or plasticity of the jaws—that if one removed a brick in the lower arch the upper arch was going to fall out. It was good to be reminded that extractions had to be very carefully thought about before they were undertaken.

The PRESIDENT pointed out that Mr. Chapman, in his last case but one, had not said whether the teeth were removed for caries or not. He wondered whether, before criticising the extraction, he had ascertained whether those six-year-old molars were saveable or not, because if not, the criticism seemed rather hard on the man who had taken them out.

Mr. CHAPMAN, in reply, said the President had reminded him of an error to which he for one must plead guilty of falling into very often, and that was for appearing to criticise the man who removed the four permanent molars without knowing what the original condition of the case was. He must confess that he did not know, and perhaps he



would have done the same thing as the other man if he had been in his shoes, but nevertheless the fact remained, that the removal of the four permanent molars was not entirely satisfactory. As a matter of fact, the patient had a considerable amount of caries, and he doubted whether she would have been very much worse off if she had had the first premolars removed rather than the first permanent molars. He thought the question about X-rays had been fully answered for him, but he could say definitely that there was a necessity to emphasise that point at all meetings. It was absolutely essential to X-ray all the teeth, whatever was going to be done. One did not know what one was going to find, and it was much better to know beforehand than to discover afterwards when it was too late to take the necessary compensating measures for any abnormality that might be found. Mr. Rix had given the criticism which he had expected in regard to the laterals becoming more prominent after a few years. Such a case was illustrated in Bennett's Second Edition, where there was some additional crowding when the third molars erupted but not to the marked extent shown in the case he had illustrated on the screen. He felt that he was very much to blame for not having a model of the case that had the two out, when he could have had the impressions. He could not help thinking that the arch must have collapsed for those spaces to become so small in about four or five years, the teeth being taken out at about 16 or 17. In regard to Mr. Watkin's question, that was the case in which there was one lower deciduous molar left. That was X-rayed. He knew there was no tooth underneath. Of course, it was five or six years ago, and whether he impressed on the patient at that time that she must on no account have that tooth out he did not recall. He could quite see now that he ought to have emphasised that point to the patient herself. Mr. King's cases showed very well two of the points that he had raised.

# SOME CASES OF LINGUAL RELATIONSHIP OF LOWER MOLARS.\*

By F. ST. J. STEADMAN, M.R.C.S., L.R.C.P., L.D.S.

## CASE I.

(By courtesy of Mr. V. A. F. Greenish.)

Robert L. Age seven years three months. Past history—*Medical*—Measles at  $2\frac{1}{2}$  years. Tonsils and adenoids removed at the age of three years. Whooping cough at five years. Slight attack of bronchitis early this year (1932). *Dental*—The right second deciduous molar was removed 7th January, 1929. The left lower deciduous molars were removed for advanced caries, 31st March, 1930.

The condition as seen on the 12th October of this year: Several carious deciduous teeth present with sinuses discharging pus. The upper incisor teeth have erupted inside the lower incisors. The first two lower permanent molar teeth are tilted lingually to such an extent that they do not occlude with the upper. The mandible gives one the impression of being too narrow for the maxilla. Although this apparent narrowing of the mandible is marked when one looks at the models of the case, yet looking at the photographs the jaw does not look markedly so. There seems to be a slight suggestion of heredity in this case as the mother's left second molar is also tilted lingually. (Figs. 1, 2, 3, 4 and 5.)



Fig. 1.



Fig. 2.

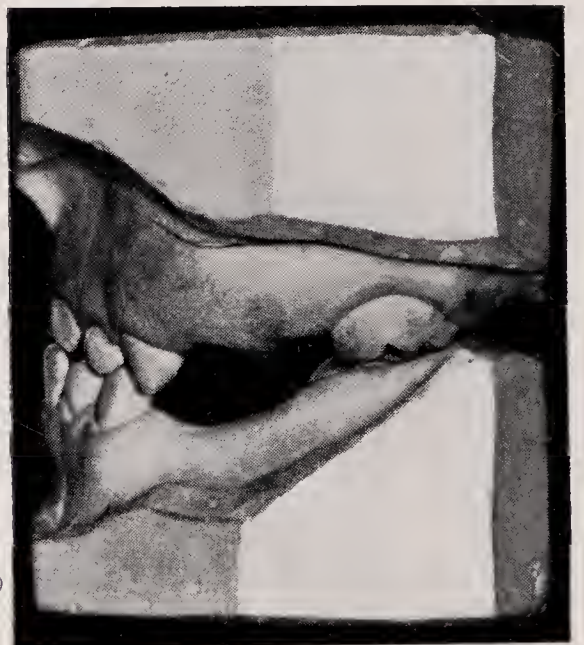


Fig. 3.

\* *Transactions of British Society for the Study of Orthodontics*, 1932.



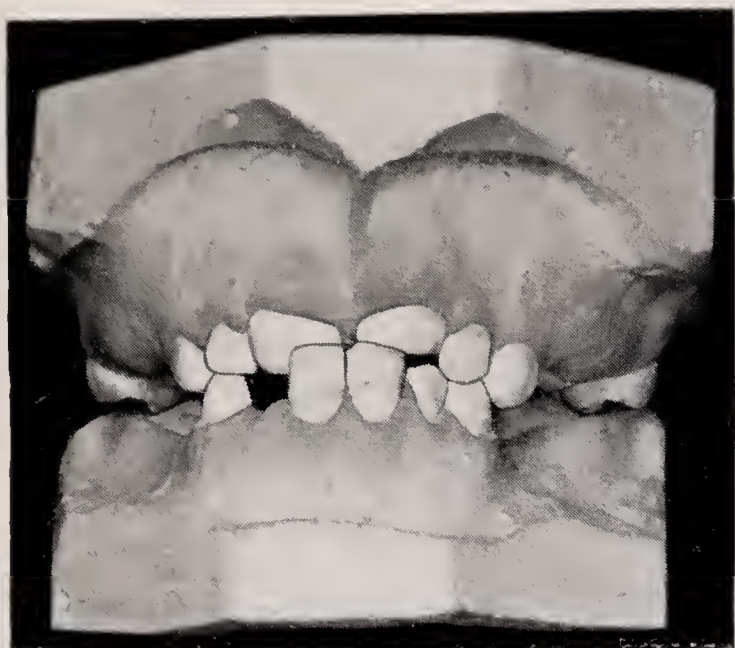


Fig. 4.

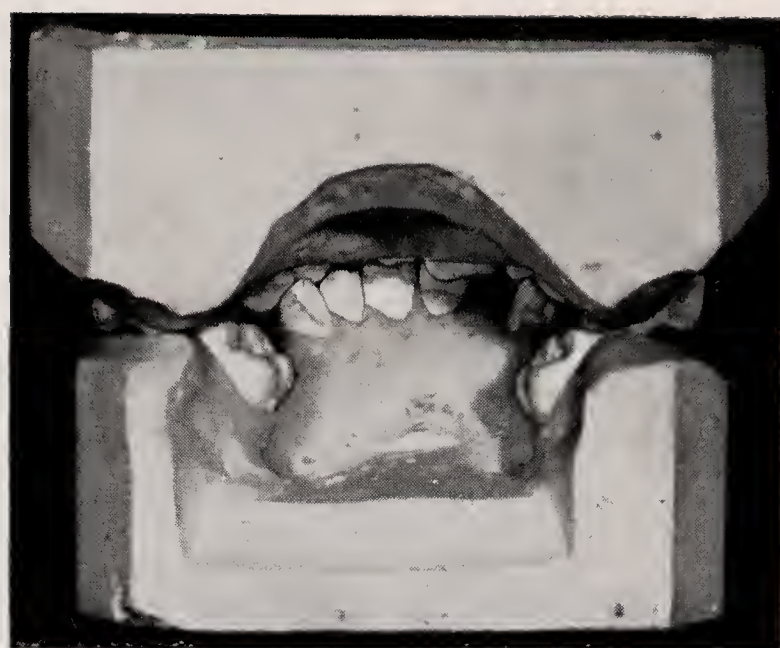


Fig. 5.

### CASE II.

Odette C. Age ten years two months. There is nothing remarkable in the past medical history of this case. The four permanent first molars, together with the second deciduous molars were removed on the 10th September, 1931.

Present condition : On the right side the whole of the maxillary teeth are situated outside the mandibular. One cannot use the word occlusion here, for they do not occlude. It is interesting to note that the deciduous teeth are present and occupy this position, and that the second permanent molar is erupting outside the arch on the right side in the line of the deciduous teeth. The lower premolars have moved backward owing to the removal of the first permanent molars fourteen months ago. (Fig. 6.)

Miss Smyth is showing two similar cases.\* The interesting point to consider is the cause of these irregularities. I could find nothing in the literature to give any information which will help us here. Many evils are ascribed to the early removal of deciduous teeth, but I do not think that this can have influenced the condition in either case.



Fig. 6.

In my case, No. 1, the only explanation I can think of is that the lower permanent molars were formed in this position in their crypts and have erupted in the line of their formation. It will be very interesting to note whether the premolars and the molars erupt in a similar manner, but this explanation, if it be correct, will not account for the apparent narrowness of the mandible.

\* These cases are given on the next page.



## SOME CASES OF LINGUAL RELATIONSHIP OF LOWER MOLARS.

By Miss K. C. SMYTH, L.D.S.

### CASE I.

DEREK B, aged  $4\frac{3}{4}$  on September 13th, 1932; models taken September 13th, 1932; photographs taken November 2nd, 1932. All deciduous teeth are present, no caries and only one filling.



Fig. 1.

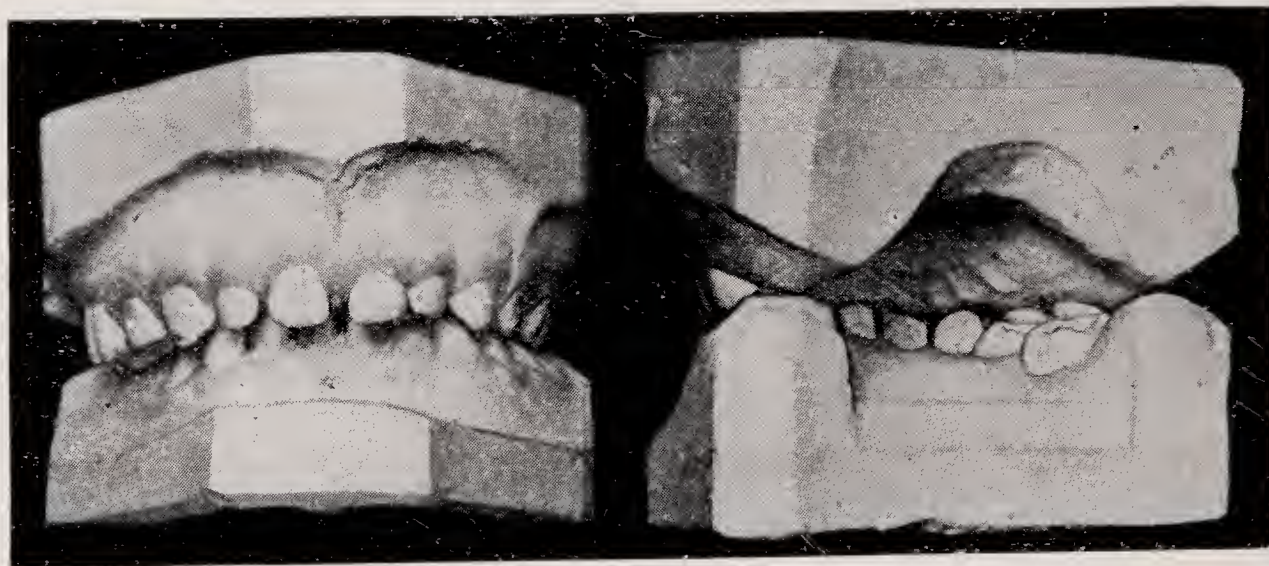


Fig. 2.

The antero-posterior relationship of the lower arch to the upper is definitely post-normal on both sides, and profile photographs show this (Fig. 1). The natural position of the lower lip is between the upper and lower incisors at all times, though the upper lip almost covers the upper incisors when the child is not smiling or talking.

On the left side the transverse relationship of upper and lower teeth is correct, but on the right both lower molars occlude completely lingually to the uppers (Fig. 2).



The centre-line shows no deviation. The lower arch is definitely flattened on the right side. There is absolutely no history of thumb-sucking or any habit which might account for the deformity. The mother is very definite about this.

Treatment was started on November 2nd and at present is directed towards expansion of the lower arch by means of a lingual arch, to be followed by intermaxillary treatment.

#### CASE II.

Robert R, age 12 years in October, 1932; first models taken in April, 1930; last models taken in August, 1932. (Each figure, for convenience of comparison, has similar views of models before and after treatment).

This case was brought for treatment because the boy took about one and a half hours to eat each meal. He was then aged  $10\frac{1}{2}$  years.



Fig. 3.

The arch relationship was post-normal (Fig. 3) on both sides, and both lower first permanent molars and lower first premolars were in complete lingual relationship to the upper arch (Fig. 4).

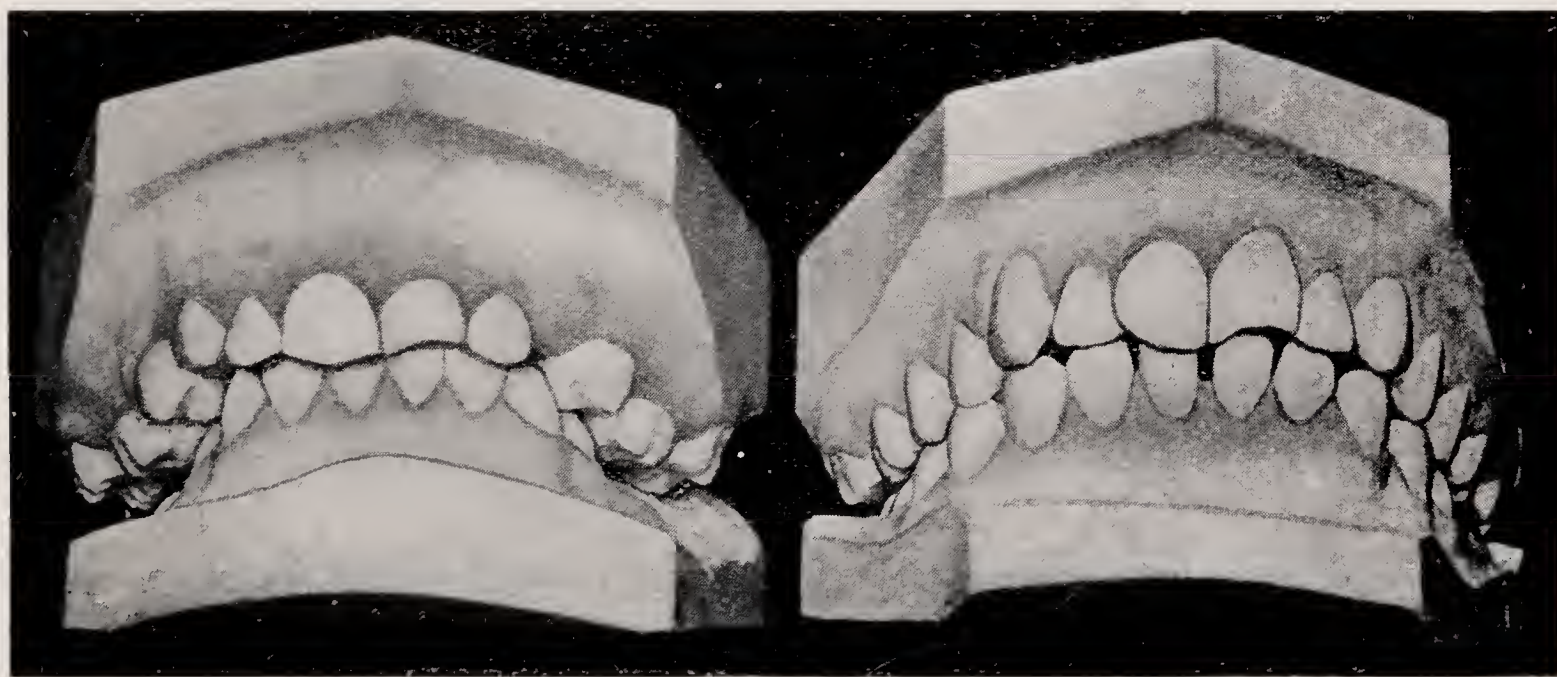


Fig. 4.

The difference in appearance of the upper incisors in these two models is due to the second one being made from a composition impression which shows some distortion.



The second premolars had not erupted fully. The molars are tilted lingually to some extent (Fig. 5), but not so markedly as in Mr. Steadman's case. The tongue was remarkably large, and lay completely over all the lower teeth, fitting inside the large upper arch (Fig. 6).

An earlier pair of models taken December, 1929, has been lent by Mr. Doubleday, who referred the case, and they show that the lower deciduous molars were in the same lingual relationship.

Treatment was directed towards the expansion of the lower arch, and a fixed appliance was made, with a U-loop in the centre. The size of the tongue caused great difficulty in making the bands, and so much trouble was given by bands coming off owing to the cement washing away before it had set, that a Badcock screw-plate was used for a time. It was very uncomfortable owing to the narrowness of the arch, and as soon as the teeth were cusp to cusp it was discarded in favour of the original appliance, which could now be fitted more easily. After this stage the case progressed

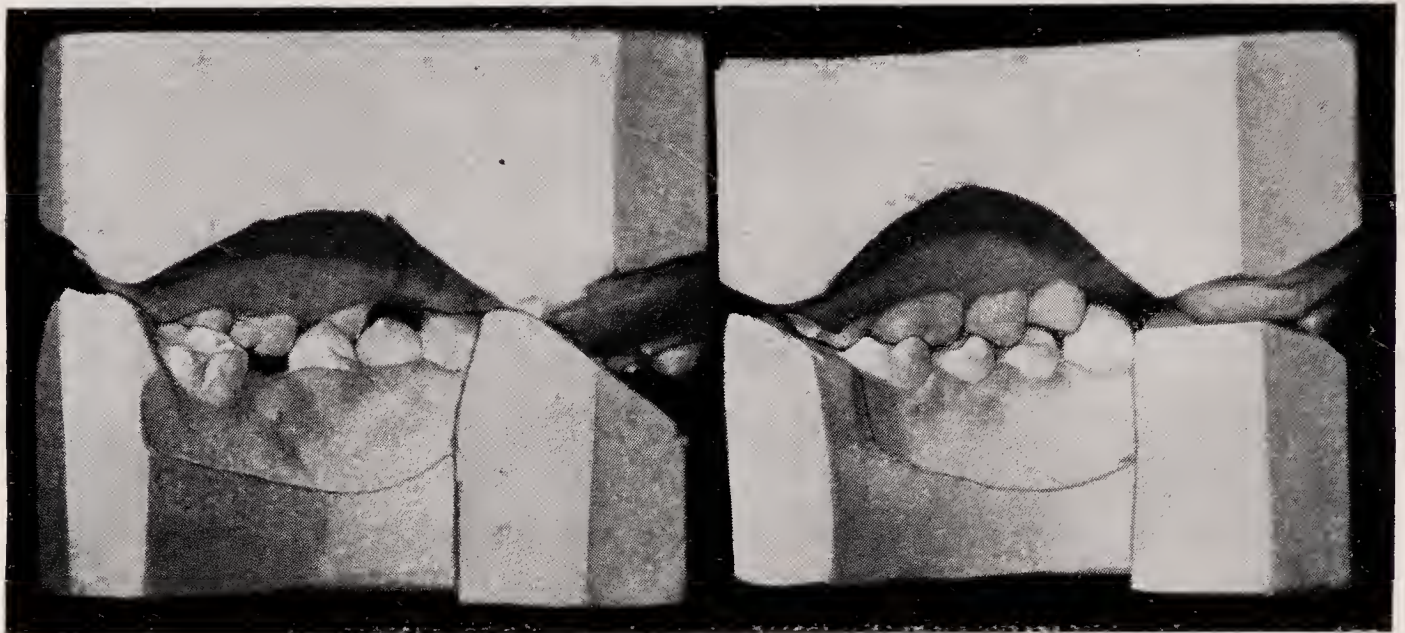


Fig. 5.

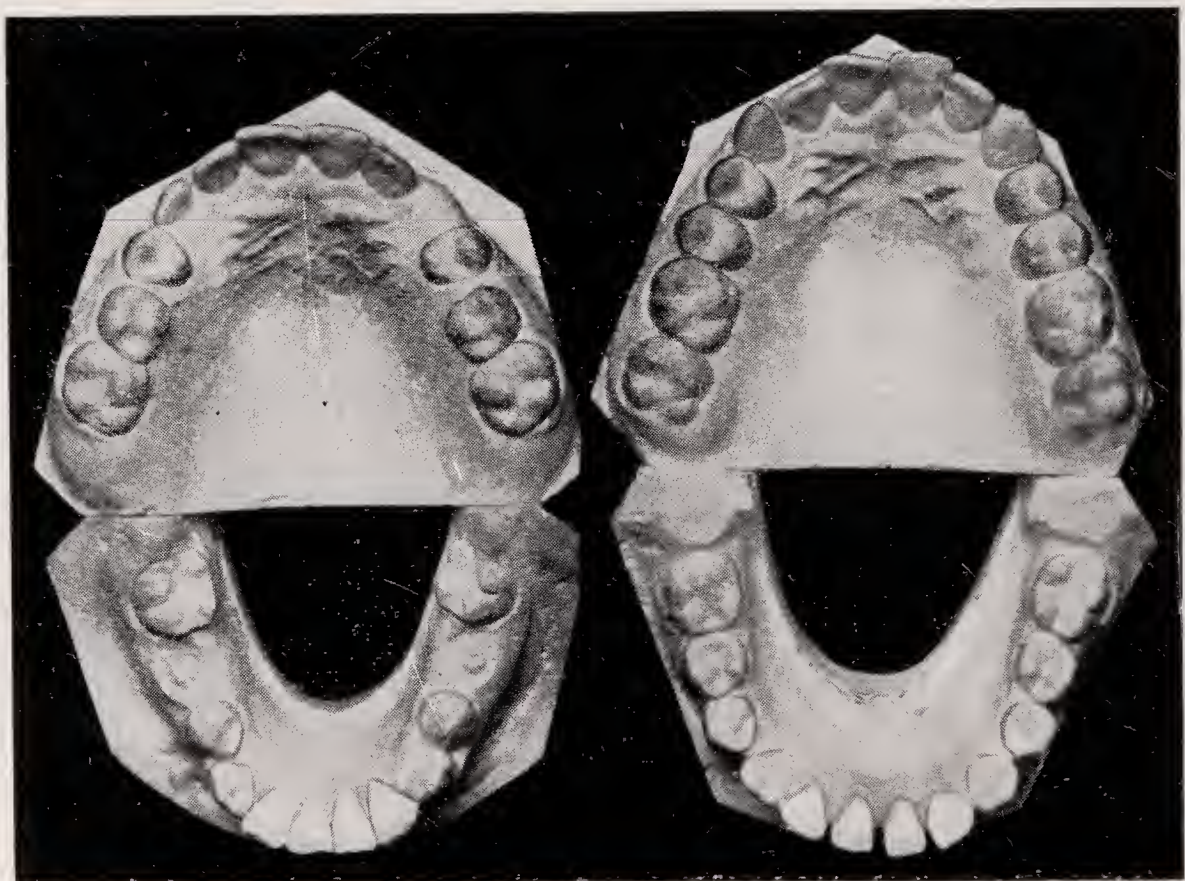


Fig. 6.



without difficulty ; at the end of about five months springs were used to move the lower premolars buccally. In January, 1932, the boy had a good functional occlusion on either one side or the other, by swinging his mandible over. A buccal arch was used in the upper for a short time, with pressure in a lingual direction on the first molars, as it was considered that they had been displaced buccally to some extent ; this hastened the improvement in molar occlusion considerably. Expansion was continued until the result shown in the final models was obtained, when a simple vulcanite lower retention plate was fitted.

Two features of the case were puzzling—the marked labial inclination of the lower incisors at the end of the treatment and the increase in the crowding of the upper incisors ; both these were unintentional results, needless to say, and I should be grateful for suggestions as to how they came about. It had been my intention to treat the post-normal occlusion after completing lower expansion, but the circumstances just referred to had made this difficult, and after considering the boy's appearance which was good, and the fact that the occlusion is undoubtedly functional, I had decided to leave the case alone for the present and watch for any change that might occur after removal of all appliances. I should be very glad to know the opinion of members as to whether this decision is a wise one or not.

MEASUREMENTS.

Breadth of Upper Arch—				<i>1st model.</i>	<i>Last model.</i>	<i>Difference.</i>
Molars	..	..	..	54.5	51.0	— 3.5
Premolars	..	..	..	40.0	39.0	— 1.0
Breadth of Lower Arch—						
Molars	..	..	..	40.5	49.0	+ 8.5
Premolars	..	..	..	30.0	36.0	+ 6

DISCUSSION.

Mr. DOUBLEDAY said that as regards the etiology there were some interesting points. The boy was an only child of parents both of whom were unhealthy. The mother was an unhealthy woman, and the father had been an unhealthy man for many years and died suddenly during the present year. The child himself was born in China, and the early years of his life were spent there ; so that his small stature and his lack of general growth were in part accounted for. Another interesting point was the lingual inclination of the molar teeth. He need not remind members of the Society of the work of Matthew Cryer, "The Internal Anatomy of the Face and Jaws," where he showed that in a patient who did not make functional use of the nose, the tongue, instead of exerting its internal pressure upon the arch, was back in the naso-pharynx, and so allowed lingual inclination of the molar teeth. In this case, however, that did not appear to be so, because the tongue was large, and overspread the cheek teeth ; and he desired to put it forward as a suggestion, whether it was not possible that the large size of the tongue, and the fact that it was spread over the teeth, prevented it from exerting normal internal pressure on the arch, so failing to exert the pressure on the deciduous teeth and also on the alveolar process.



## FOUR CASES OF IRREGULARITY IN THE MAXILLARY INCISOR REGION.\*

By F. BOCQUET BULL, M.R.C.S., L.R.C.P., L.D.S.

### A CASE OF ONE SUPERNUMERARY TOOTH.

M. W., a girl aged 8 years 6 months.

The original condition is shown on the screen (Fig. 1) before the loss of the temporary incisor teeth. This is of interest as it shows the upper left temporary central incisor rotated in the same direction as the permanent successor seen in the next slide (Fig. 2). The irregularity was due to the presence of an unerupted supernumerary tooth, which was removed in June, 1930. I regret that the X-ray of this case appears to have been mislaid. The permanent central was rotated later by means of fixed apparatus.

This apparatus consisted of a labial bow combined with grass-line ligatures. It was fitted on September 30th, 1931, and a retention plate was fitted on January 22nd, 1932. The ligature ran from the palato-distal part of the incisor to a notch in the bow. (Figs. 3 and 4).



Fig. 1.



Fig. 2.

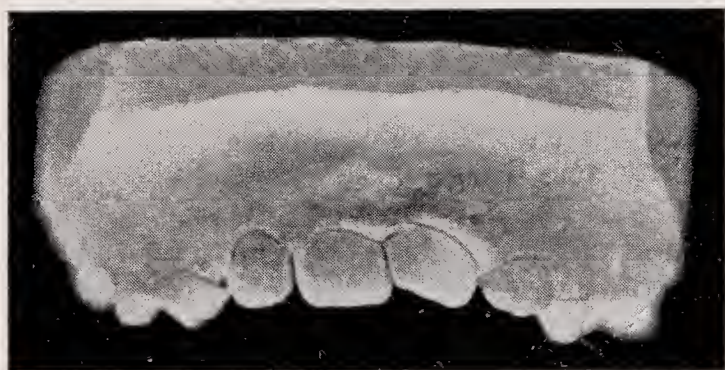


Fig. 3.



Fig. 4.

\* *Transactions of British Society for the Study of Orthodontics*, 1932.



## A CASE OF TWO SUPERNUMERARY TEETH.

L. B., a boy aged 7 years.

The condition is seen very well on the screen (Figs. 1 and 2), and is notable for the presence of two supernumerary teeth in the incisor region of the upper jaw, causing a complete displacement of the I to the right, together with a rotation through a complete right angle, the mesial border facing anteriorly. The lower incisor teeth have been naturally somewhat affected.

The treatment of the case consisted of the removal of the supernumerary teeth and the rotation of, and movement towards mid-line of I. The supernumerary teeth were extracted some time previously to the commencement of the treatment by appliance (Fig. 3).

The first appliance was a simple palatal plate with a labial wire, and a small finger-spring pressing on the distal border of I fitted on November 24th, 1930. Owing to the poor eruption of the molars the plate was not too stable in the mouth, and although some improvement was made, an all-screw upper bow was fitted in February, 1931. A rough diagram of this apparatus is seen on the screen (Fig. 4). On September 14th, 1931, an upper retention plate was fitted. Fig 5 shows the condition when the retention plate was fitted.

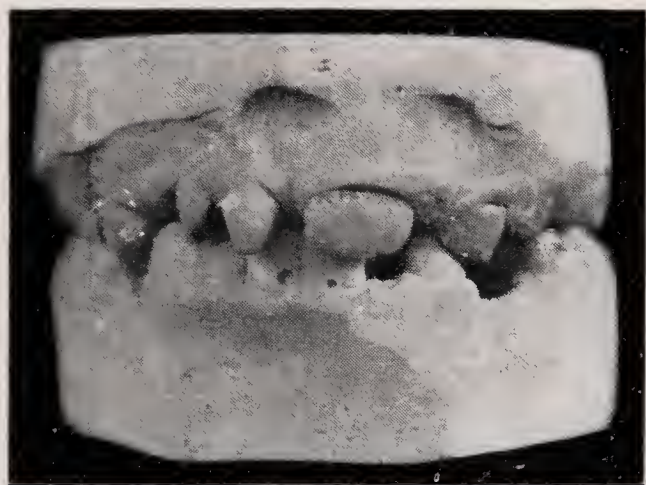


Fig. 1.



Fig. 2.

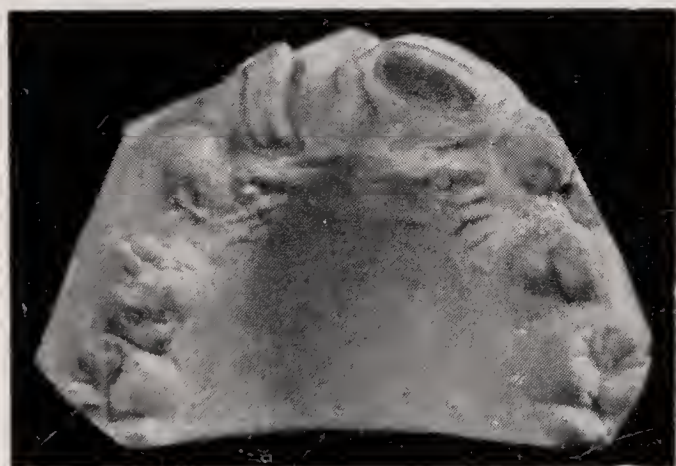


Fig. 3.

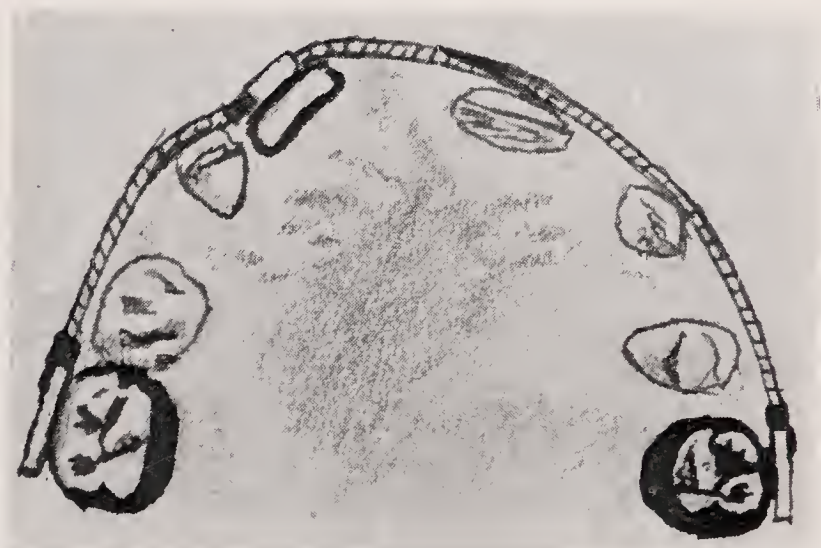


Fig. 4.



Fig. 5.



# A CASE OF THREE SUPERNUMERARY TEETH.

V. M., a girl aged 11 years 6 months.

The condition shows irregularity in the upper incisor region (Fig. 1) as follows:—

I | unerupted ;

| I outstanding and higher than the level of the rest of the arch.

Two supernumerary teeth are seen, one in the situation that should be occupied by I | , and the other just distal to the situation that should be occupied by | I.

Apart from this irregularity, the arrangement of the other teeth (apart from a very slight overcrowding in the lower incisor region), and the relationship of the teeth of the upper and lower jaws, is much above the average (Figs. 2 and 3). I point this out, as had the patient not been troubled with these supernumerary teeth, she would have been blessed with a rare condition—a practically perfect denture. When the upper incisor region was X-rayed, a third supernumerary tooth was seen, distal and to the right of the supernumerary tooth on the right side (Fig. 4). The three supernumeraries were removed under a general anæsthetic on December 1st, 1931. No other treatment was undertaken, and on March 3rd, 1932, | I was at a slightly lower level and had moved palatally to an appreciable extent (Figs. 5 and 6).



Fig. 1.

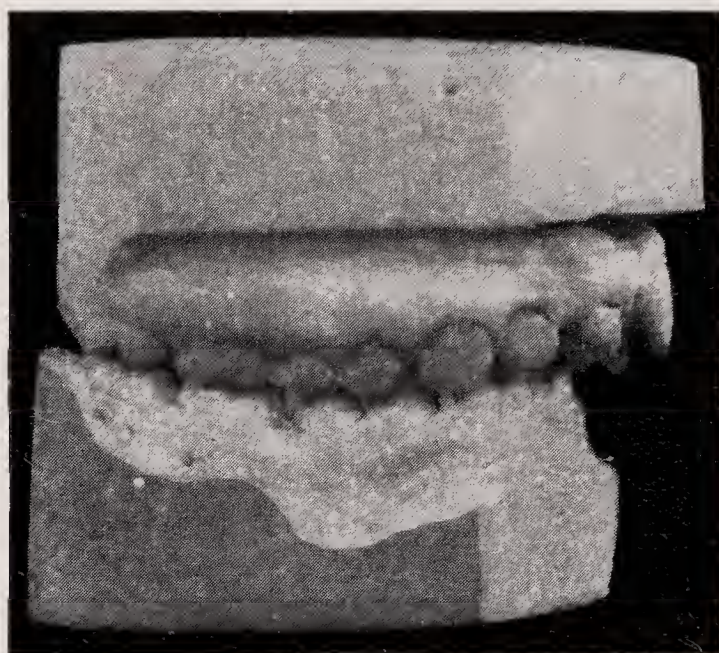


Fig. 2.



Fig. 3.



Fig. 4.





Fig. 5.



Fig. 6.

Repeated applications to the patient to again present herself have been futile, and I can only show you this case as being one of a rather rare condition, instead of, as I had originally hoped, a corrected case either with or without treatment—apart, of course, from the extraction of the supernumerary teeth.

#### TRAUMATIC LOSS OF THE UPPER CENTRAL INCISOR TEETH.

(Report as given to me by my Assistant House Surgeon. It has not been altered to the hard materialistic version of most reports, as I consider it gives, like the resultant upper arch, “a very pleasing” account of the case.)

G. T., aged 12 years 4 months.

Between the age of 6 and 7, Gwendoline—whilst riding her fairy cycle—crashed into a full-sized bicycle coming in the opposite direction. Her partially erupted upper central incisors struck the bicycle’s handle-bars and were knocked straight out into the road, the roots and apices intact.

As soon as the upper laterals commenced to erupt, on advice of her mother, Gwendoline learnt the habit of pressing the two lateral teeth together with her finger and thumb, whenever her hands were not otherwise occupied. As a result she—at the age of 12—has a very pleasing upper arch with the laterals slightly spaced, and good contact elsewhere, the whole result being quite natural (Figs. 1 and 2).



Fig. 1.

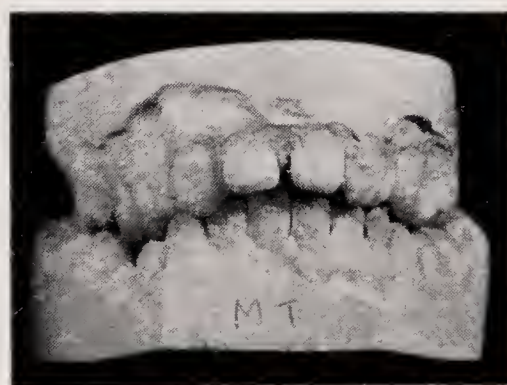


Fig. 2.



This case is of interest for the following reasons :—

(1) It is a case which goes to prove that, the patient being of a suitable age when a tooth is lost by trauma or extraction in the incisor region, it is advisable to allow the space to close up rather than to condemn the patient to the use of a denture by retaining the space.

(2) The distance which teeth will move to close up a space.

(3) The cleverness of maternal instinct.

#### DISCUSSION.

Mr. CHAPMAN said that one of Mr. Bull's cases, the one where the deciduous upper central was rotated, reminded him of one he had seen about a week previously. He had seen a similar case (a boy six years of age) in which there was a supernumerary tooth between the deciduous centrals. These, however, were quite straight, but one of the permanent centrals beneath was rotated through 90 deg., the same as in Mr. Bull's case.

Mr. STEADMAN said the first thing he had noticed about Mr. Bull's last case was that in spite of the enormous room that was gained by the loss of two centrals, yet the second premolar on the left side was crowded out of the arch. That was very curious, he thought, in view of the enormous space left due to the loss of the two central incisors.

Mr. BRODERICK said he desired to ask a question as the junior member of the Society. When the two centrals were knocked out, and the two laterals came together, it made a nice job, but if only one central were knocked out it would not look so nice. In those circumstances, would it be legitimate to take out the other central ?

Mr. STEADMAN said that he could not agree with Mr. Broderick's remarks and it was often not unsightly when a single central incisor remained in the mid-line. The loss of only one central incisor was always preferable to two.

Mr. BULL said he thought that question depended a good deal on the age of the patient. He did not think one would expect it to happen in the case of an "elderly child," if he might use that expression, as one would in the case of a younger child. He thought that each case had to be considered by itself.

Mr. KING asked Mr. Bull what was the condition of the lower jaw. It seemed to him that the lower jaw would be very much too big, having lost so much in the upper.

Mr. BULL said he presumed that the teeth drifted in a forward direction, and, as Mr. Steadman had mentioned in referring to the "crowding-out" of the upper right second premolar in a palatal direction, the teeth had come forward tremendously. He thought that the relationship of the upper and lower arches provided a thoroughly good denture.

ANOTHER MEMBER asked whether Mr. Bull would say if the lower incisor was in such a position in relation to the upper that the upper tooth could fall back so as to come into line. It seemed to him that if the denture was a normal one it would not be possible to pull the teeth sideways. He could give a case in point from his own practice, where a lad of six or seven years of age had lost both centrals in exactly the same way as in the case described by Mr. Bull, and now at the age of twenty he had a very unsightly gap about the width of one central.

Mr. BULL said that perhaps the mother of the last-mentioned patient was not quite so sensible as the mother of his own patient, because the treatment adopted by his patient's mother had greatly aided the movement of the laterals. He had never seen the patient until the treatment was completed.



## INCISOR TOOTH DEFICIENCY IN THREE GENERATIONS.\*

By A. C. R. McLEOD, L.D.S.

THE author directed his remarks to a diagram depicting the inter-marriage of four families, members of whom were unfortunate enough not to possess their second incisors (upper laterals). One family had come from Scotland, and the others from various parts of the United States. In the oldest family shown in the middle of the chart, the father possessed laterals, but the mother did not. They had five children, four boys and one girl. Two boys had no laterals, and one of these married the daughter of another family in U.S.A. This lady had only one canine. Their children, three boys and one girl, had no laterals. The chart shows the linking of this family with that on the right of the chart by the marriage of a son of the former family with a daughter of the latter.

This latter's family consists of two daughters and two sons, none of whom, in common with their mother, has any laterals.

From this union there is one daughter with no deciduous laterals, as shown on the lower right side of the chart.

To return to the chart, we see on the left families in Scotland who have inter-married. The first dental history shows a son with spaced teeth married to a daughter of another family who has all her teeth, but whose sisters have one or both laterals absent.

The children of this union are two daughters with good teeth, and a son with one lateral, and that one malformed.

The son was united by marriage to a grand-daughter of the oldest family, as shown on the chart. Here the husband has one lateral and the wife no laterals.

One of their children had no laterals but all deciduous teeth present.

In indicating other points on the diagram, the speaker said that the reason why he brought it forward was because in the case of one family no orthodontic treatment had been done, while in another case the spaces had been retained by orthodontic means, and filled with dentures, which were constructed on a continuous clasp principle, and caused cavities all round the mouth, the care of which required constant attention. The question was what to do with the youngest generation. Should an attempt be made to open the spaces with orthodontic appliances or to close them or allow them to close themselves if they would? With one of the children the parents wanted something done very soon, and in view of the family history he did not know what to advise. On one side nothing had been done, and some members of the family were satisfied and others were not; on the other side, orthodontic appliances, dentures, and bridges had been used, and, again, some were satisfied and others not.

### DISCUSSION.

Mr. H. G. WATKIN said that this had been a very interesting communication. He thought that, as regards treatment of the new cases, he would not hesitate to fill up the spaces, and at a later date trim off the tips of the canines. This was very much better than to attempt bridge work or plates. It might be necessary to remove some of the lower teeth.

Mr. MAXWELL STEPHENS said he would close up the spaces unless there was any wish in the mind of the parent that something else should be done.

\* *Transactions of British Society for the Study of Orthodontics.*



The diagram consists of two identical horizontal structures. Each structure has two circles on the left, connected by a horizontal line. The line is labeled "NO HISTORY" in a box. The circles contain the letters "F" and "M" respectively. The same structure is repeated to the right.



Circles with white space signify NO HISTORY.  
Circles with lined tint signify NO LATERALS.  
Circles with dotted tint signify LATERALS  
PRESENT.  
Circles with tint half dots and half lines signify  
ONE LATERAL ABSENT.



Mr. J. H. BADCOCK said that the history was one of the most complete he had seen for a case of this kind. They all knew how common it was to find that the parent or some relative of the patient suffered the same disability, such as absence of lateral incisors, but he was afraid that he at any rate had never traced the history back so far as had been done in this case. With regard to treatment, he agreed with previous speakers. It seemed to him entirely wrong to saddle the child with some mechanical apparatus that he would have to wear for the rest of his life. It generally meant trouble in the future. He had no doubt whatever that the best thing to do was to close up the spaces. Some such treatment was infinitely better than the insertion of a mechanical appliance.

Mr. HERBERT introduced a comparable case of family inheritance. The two lateral teeth were missing in the case of the mother, and one child had a cleft palate on one side with the lateral missing, while another child showed the absence of both canines.

THE PRESIDENT said that he had seen similar cases, and that evidently there was scope for all sorts of treatment.

Mr. MCLEOD, in replying on the brief discussion, said that he appreciated the fact that most of the speakers had given him the same advice, and that seemed to be the one line of treatment open to him. He had been asked the question several times before the meeting whether he had seen any indication of cleft palate in any of these cases, but he had not done so. Following the discussion he now thought it would be right to close up the spaces.

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### **“A CASE OF IMPACTED CANINES.”**

### **“A CASE OF MISSING LATERALS.”\***

By F. L. KING, L.D.S.

THE first case, one of unerupted canines, I am placing before you not because it is unique or that the manner of treating it differs from that of any other case of this class, although I will remark in passing on a point of technique; but principally because I wish to ask a few questions on this type of case in general and I hope that it will prove of sufficient interest to promote your discussion.

The child, a girl aged 11 years, presented an almost normally formed upper arch. Since it was known that the child's mother did not erupt her permanent canines, radiograms of the child's mouth were made, by which it was ascertained that the permanent canines were lying in the palate almost horizontal, with their cusps almost in juxtaposition. By orthodontic treatment these teeth were caused to erupt into their normal positions in the arch.

The method was the ordinary and obvious one of exerting a pulling force upon the crowns of the canines. The anchorage for the force was a buccal arch and the force unit was india-rubber bands at first and auxiliary wire springs later.

The application of the force to the canines was by means of wire hooks. Now this is where the technique may be a little different from the usual. I found that owing to the great depth of the canines in the tissue and to hæmorrhage that took place in the small deep incision, that it was difficult to successfully cement a hook into a necessarily shallow hole in a tooth of whose surface only a very small area was visible. So in this case the hole was threaded with a watchmaker's threading tap and a hook threaded to match was screwed into it. In order to drill the hole to a safe depth a loose sleeve was placed upon the drill. The tools are shown on the table.

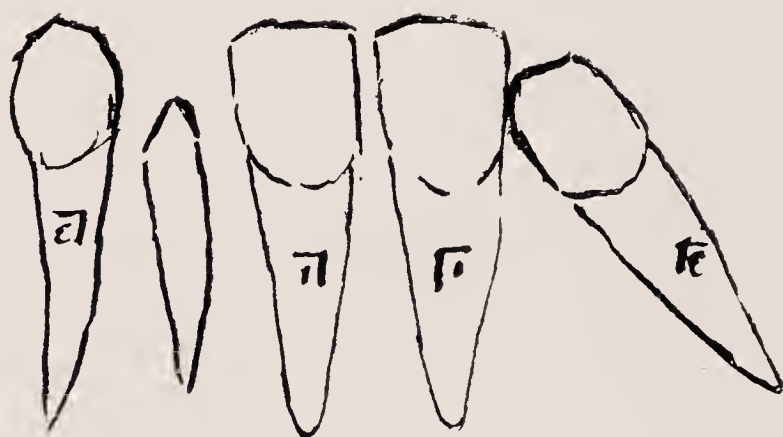
\* *Transactions of British Society for the Study of Orthodontics*, 1932.



Now the questions :—

- (1) What is the incidence of these cases, i.e. are they very very rare, or rare, or met with frequently?
- (2) What is the etiology of such a case where teeth fail to erupt into correct position even though the arch be well formed and there is sufficient room for them so to do?
- (3) What would accrue if such a case was left untreated?
  - (a) Would not the temporary canines ultimately absorb and have to be replaced by a prosthetic appliance?
  - (b) Then also is there the likelihood of pathological trouble arising from the abnormal position of the unerupted teeth?
    - (1) By pressure upon nerves?
    - (2) By pressure upon other teeth with perhaps resultant malposition and/or absorption of these latter teeth?

Concerning pathological disturbance by pressure upon nerves. I have here for your inspection models and radiographs of the mouth of the mother of the case. There you will see that the left canine is unerupted and that the right canine is only partially erupted; this latter tooth was brought into position, the mother reports, by orthodontic treatment at the age of about 16 years, because attacks of very severe neuralgia pains were thought to have been due to the pressure caused by the abnormally placed canines.



As you will see, from the æsthetic point of view, the treatment in the case of the right tooth was only partially successful, and was therefore not attempted upon the other. The neuralgia, however, disappeared.

Concerning pressure upon other teeth. I also show here to-night radiograms and the actual teeth of a case where the unerupted canine had caused almost total absorption of the root of the lateral incisor.

Also in the *British Dental Journal* of October 15th, there is a reprint from *Revue de Laryngologie*, of a case of extremely severe neuralgia due to the pressure of an unerupted premolar. Now there is yet another question, that is, what are the dangers that might accrue from the carrying-out of this work?

Mr. Stobie, in a paper recently read before the Southern Counties Branch, mentions the risk of irreparable damage being done by ill-judged attempts to displace such an embedded canine.

I should be pleased if you will discuss these questions and tell me of your experiences with similar cases.



My second case is apropos Mr. McLeod's communications of last meeting. I will give you the case first and afterwards my reasons for bringing it forward. The right lateral incisor is missing and the right canine is slanting obliquely across the space and is somewhat rotated so that its mesial-labial angle is almost, and soon will be, overlapping the disto-labial angle of the central incisor as shown in diagram.

The left lateral incisor is not missing, but is of very rudimentary shape. Mr. McLeod asked for advice in treating his cases, and if I remember rightly, all the speakers suggested that he should let the canines close up to the central incisors. It was noticeable to me how freely they gave this advice regardless of the individual circumstances that may have obtained in those cases. Their attitude rather gave the impression that there is a treatment common to all cases of missing laterals, viz. let the canines close up to the centrals.

Now I would like to suggest that such a line of action would not give a good result here, and that alternatively it would be better to move the crown of the canine back and to replace the lateral prosthetically and match it on the right with a jacket crown placed upon the rudimentary lateral. I should be pleased to hear your observations.

#### DISCUSSION.

The PRESIDENT said he had on two occasions seen upper laterals which had been absorbed, even to the crowns, by the advancing upper canines.

Mr. NORTHCROFT wondered if Mr. King was acquainted with the orthodontic section of the odontological museum at the Royal College of Surgeons, but judging from the large number of cases of impacted canines that had been collected there, the anomaly was by no means uncommon. He thought that every type of impacted canine that was ever likely to be encountered was represented, from canines erupting through the floor of the nose to two canines meeting in the mid-line in the palate. The use of X-rays was of great help to see if absorption was taking, or likely to take place. He had tapped screws into canines to bring them down, but it was a little difficult to cut a thread in enamel, and it was necessary to use a very well-tempered tap to do that. He had found of considerable use cementing a split pin in an under-cut hole, just as a stone-mason puts in a key to raise enormous blocks of stone. That was an excellent way of getting over the difficulty of getting traction on unerupted teeth, whether they were canines or any other teeth.

Mr. CHAPMAN said he more or less agreed with Mr. Northcroft as to the incidence of impacted canines. In his opinion such cases were rare, but perhaps not very rare. He had seen about eight or ten in the last fifteen years in private practice. One frequently found that two impacted canines were in otherwise very good arches. With regard to dislodging them, he was not clear whether Mr. Stobie referred to extracting them or to moving them into the arch. As regards bringing them into place, he had not found that there was any danger at all in doing that. The only difficulty was, when the canines were at a very bad angle to get them into a presentable position: that seemed to be the chief difficulty in those cases. As regards whether it was wise to leave them alone or not, he thought that depended on the individual case again. In the case of the girl aged about 21, which he had shown, the one who had one deciduous molar removed, she had one horizontal canine, and the corresponding deciduous one in



place, and it was decided in her case, after consultation as to what she would prefer, to leave the deciduous canine and horizontal canine, and if the latter ever gave trouble to have it removed then. It seemed to him that the decision depended on individual circumstances. With regard to the permanent canine which was not quite vertical, he did not think it should be very difficult to straighten that tooth. One could have a spring to bring the tip of the canine distally, and another spring on the other side, near the neck, to tilt the root medially, or else it could be done by means of a spring attached to a half round rod entering a tube soldered to a band on the canine, and then the tooth could be moved in any desired direction.

#### ANNUAL GENERAL MEETING, 1932.

THE annual general meeting of the Society was held at Manson House, 28, Portland Place, W.1, on Monday, December 5th, 1932. Mr. CARL SCHELLING (President) was in the chair.

The minutes of the last meeting were confirmed.

Members stood while the PRESIDENT announced the death of Mr. Nigel Campbell. Mr. Campbell was, he said, only 25 years of age; he had spent a very happy holiday in Spain, but had been taken ill within a week of his return and had passed away in another seven or eight days. He was the son of Dr. Graham Campbell, of Dundee, a very well-known member of the British Dental Association. The meeting would, the President was sure, wish the Secretary to send the father a note of sympathy.

Mr. C. S. HENDERSON, L.D.S., R.C.S., a candidate for election, was elected unanimously by a show of hands.

The PRESIDENT announced that, no other nomination having been received, the officers and councillors nominated by the Council whose names were set out were elected, and that a ballot would be unnecessary.

#### OFFICERS AND COUNCILLORS, 1933.

President, Mr. H. G. Watkin; Immediate Past President, Mr. Carl Schelling; Vice-Presidents, Mr. B. Samuel, Mr. A. L. Packham and Mr. F. B. Bull; Secretary, Mr. R. Cutler; Treasurer, Mr. H. R. Evans; Curator, Mr. H. C. Highton; Librarian, Mr. S. A. Riddett; Editor, Mrs. L. Lindsay; Councillors, Sir Norman Bennett, Mr. S. St. J. Steadman and Miss K. C. Smyth.

Mr. F. L. King and Mr. A. Garrow were elected auditors.

The PRESIDENT delivered his valedictory address from the chair:—

#### VALEDICTORY ADDRESS.

It was only last Friday evening that I found that a valedictory address was expected from the President, so I must be brief. I have passed through many steps: new member (but I don't know if I was an original member); committee-man; then, on the late Mr. Hopewell-Smith's election to a professorship in Pennsylvania University, his successor as honorary editor, which office brought me into relation with many of the contributors to the *Transactions*: well-known members of our Society and others of world-wide distinction, such as Professor Brash, Mrs. Mellanby and Sir Arthur Keith—who is, I am glad to say, now well on the way to recovery. All these contributors, being accomplished authors, gave me rather less trouble than I had in transfiguring the relentless reporters' verbatim notes of my own halting and disconnected, but fortunately infrequent, remarks into a few lines so much improved that no one present would have recognised them for the same! But the *Transactions* are not as complete as they should have been. One paper on "Anglo-Saxon Graves" was not published, as it had been promised elsewhere, and



another manuscript—by a foreign gentleman whose fluent delivery in English delighted me as much as I was depressed when I considered how little I knew of his beautiful tongue, in which I had passed the Senior Cambridge examination quite easily in 1881 and which does not, as George Borrow remarks of that spoken by the Papal Guards, resemble the cracking of nuts—has never yet been received by the editor!

When I retired from the editorship I was far more than compensated for my labours by your kind thanks and by the very delightful and artistic gifts which have been a source of pleasure to me and others ever since, and for which I can never be sufficiently grateful to this Society.

You may have heard of the elderly clergyman whose parishioners were so delighted to hear of his impending resignation that they arranged a social evening and a presentation to their vicar, who then nearly broke down as he said that he had always been glad to serve them, and that he grieved to leave them, but, on receiving their new mark of affection, he had cause to be thankful that he had not yet resigned, and that he could only show his appreciation by remaining among them until his dying day! Well, you are more fortunate in this matter, for I must retire to-night, no matter how kind you have been to me, and what consideration I have enjoyed from both the Council and the members in general!

In Mrs. Lindsay you have an honorary editor who may not serve you as long as I, but who sheds lustre upon her office by her great achievements and knowledge of orthodontics, and of the dental history of our own and many foreign lands.

I need not recapitulate the work of this Society in the past year. Great things have been done at the meetings of the Second International Orthodontic Congress in London, and at the British Dental Association's meeting at Toronto, where Dr. George Northcroft was the recipient of the well-earned honorary degree of Doctor of Laws of the University of Toronto.

You have elected as President Mr. H. G. Watkin, who has made many useful, interesting and original contributions to our stock of knowledge, and who in his year of office in these new quarters—which are so conveniently placed and so well fitted to be the scene of our deliberations—will, I have no doubt, enjoy the same loyal support as has always contributed so markedly to the success of our meetings.

Finally, I must gratefully admit that whatever good organising work has been done in the past year has been done by the Hon. Secretary the Treasurer and the Council, to whom I am deeply indebted, the more so if any of them happen to remember that a not very long deceased statesman was reported, whenever he could, to have said to any proposer of a new plan: "I would very much rather that *you* did it, if you don't mind."

At the close of his address Mr. Schelling invested his successor, Mr. H. G. Watkin, with the badge of office.

The new PRESIDENT, in thanking the Society for electing him to that office, said that he would do all in his power to further the interests of the Society and to be worthy of the position in which he had been placed. The practice of orthodontics was fulfilling a great need in making happier the lives of those whom it benefited. A father had come to him a few days before to pay the account for the treatment of his daughter; he had said: "I am paying this bill very willingly, because I shall now get her off my hands!" He had had as a patient a rather nice girl of about 19, and when he had examined her for the last time, to see that things were "staying put," he had remarked in a jocular manner: "We shall very soon hear that you are getting engaged." She then pulled off her glove and showed him her engagement ring, a month old. (Laughter.)



## HON. SECRETARY'S REPORT, 1932.

Members of the Society should by now be accustomed to hearing reports of continued expansion of its activities, and this year has proved no exception. It has been characterised by some changes, chief amongst which has been a further alteration in the Headquarters of the Society : our tenure of 28, Portland Place was in the main a happy one, and cordial relations were preserved throughout with the Council of the Institute of Hygiene, but many of our members expressed dissatisfaction with the accommodation generally, and when an opportunity occurred for our Society to take up tenancy of Manson House, the executive was not slow to take advantage of it.

At present a yearly tenancy is in operation, but it is hoped that a long-term agreement can be arranged at the conclusion of the period covered by our agreement.

Members have, by now, had an ample opportunity of judging the amenities of the new premises, and few can doubt the wisdom of the Council's decision. Scrutinising the membership, it is noted that 15 new members have been elected, this comparing adequately with last year's of 26 and the previous one of 14. Five have resigned, 2 have died, and 5 names erased from the register, so that the membership now stands at 251.

Most noteworthy, however, is the steadily increasing attendance at meetings, the average for this year being not less than 50.

Seven meetings were held on the usual dates, the President's address being particularly interesting, whilst the remainder covered a diversity of subjects : this year has seen an encouraging increase in the offers of papers for 1933, and the main programme is now complete.

Although there have been welcome signs of rehabilitation of credit and industrial prosperity, the national and international situation has remained one of great complexity, and it should be a matter of gratification that interest in, and work for, the meetings of the Society have been so fully maintained.

## HON. CURATOR'S REPORT.

I wish to say that I have examined carefully all the resources of Manson House, with a view to the accommodation of the Society's cabinets, and the only available room is in the cellars at the back of the lecture hall, apparently no other space being available.

I regret to say that both these so-called rooms are quite unsuitable being extremely damp even in summer time. I took the trouble to obtain expert opinion, but was told that it would be impossible to get either of these places dry, without thorough ventilation, and that would be difficult, as the cellars are situated under a garage.

## THE SOCIETY'S MUSEUM.

Mr. G. NORTHCROFT asked whether any arrangements had been made for the housing of the museum or library. The Society would, he said, like to have news on that point.

The PRESIDENT replied that the Council had fully considered the matter. Any attempt to conceal the Society's rather large articles of furniture in Manson House would be impossible ; the cases would be placed somewhat badly, and this the Society could not tolerate. The Honorary Secretary had been making inquiries for a place where the furniture could be stored without deterioration. In the immediate future there would be no opportunity for their use, but the Council were taking great care of them, for they valued them very highly.

Mr. NORTHCROFT said that he sincerely hoped that the Council would give the matter their fullest consideration, because not only was the furniture very valuable, but the specimens contained in the cases could not now be seen by members of the Society.



The PRESIDENT answered that the specimens were perfectly safe inside the cases, and that the Council did not want them to be placed where they could be damaged by damp.

Mr. NORTHCROFT suggested that the Society should thank whoever was looking after the cabinets, because if they were now in a dry and suitable habitat a very important service was being performed.

The PRESIDENT said that they were a constant anxiety to those responsible.

Miss LILAH CLINCH read a paper, "VARIATIONS IN THE MUTUAL RELATIONSHIPS OF THE UPPER AND LOWER GUM PADS IN THE NEW-BORN CHILD."

Mrs. MICHAELIS read a communication entitled: "MOVING TEETH OVER THE BITE."

#### HON. TREASURER'S REPORT, 1931-1932.

During the past year the Society's income has been £235 17s. 2d. which is a slight increase on the previous year. This sum is chiefly from members' subscriptions.

The expenditure has been £156 5s. 1d., as compared with £154 7s. 7d. the previous year. This leaves a credit balance of £79 12s. 1d.

The Society's assets are 500 National Savings Certificates at a present value of £493 15s.; cash on deposit, £130; cash at the bank and in hand, £41 10s. 2½d.; making a total of £665 5s. 2½d., as against £567 9s. 3½d. last year.

I should like to thank my predecessor, Mr. Visick, for handing the books and accounts over to me in such excellent order, thereby rendering my task a comparatively light one.

*December 5th, 1932.*

H. R. EVANS, *Hon. Treasurer.*



BRITISH SOCIETY FOR THE STUDY OF ORTHODONTICS.

BALANCE SHEET, 1931-1932.

RECEIPTS.	1930-31		1931-32		PAYMENTS.	1930-31		1931-32	
	£	s. d.	£	s. d.		£	s. d.	£	s. d.
Members' Subscriptions ...	...	...	230	19 1	...	...	...	...	...
Sale of <i>Transactions</i> ...	...	...	1	1 0	Accommodation of Cabinets at Institute of Hygiene ...	...	...	6	6 0
Deposit Interest ...	...	...	1	11 11	Printing and <i>Transactions</i> ...	58	10 5	63	6 3
					Reporting ...	18	18 0	21	0 0
					Refunded Subscriptions ...	3	3 0	—	—
Transferred from Deposit...	...	...	£233	12 0	Register ...	4	4 0	—	—
			125	0 0	Honoraria ...	5	5 0	—	—
					Removals ...	3	0 0	—	—
					Refreshments ...	21	5 0	15	15 0
					Hire of Epidiascope ...	6	6 0	11	1 6
					Hire of Electric Table Standards ...	—	—	2	2 0
					Petty Cash ...	15	0 0	14	0 0
					Bank Debits ...	0	0 2	0	8 6
					Insurance on Books and Badges ...	—	—	1	7 4
					Volume for Library ...	—	—	3	15 0
					Costs of Agreement with Royal Society of Tropical Medicine ...	—	—	4	11 6
					Transfer to Deposit ...	£154	7 7	£156	5 1
					Grant to Orthodontic Congress ...	200	0 0	55	0 0
					Balance ...	£354	7 7	£211	5 1
						4	4 5	24	12 1
						£358	12 0	£235	17 2
					ASSETS.				
					500 National Savings Certificates value ...	—	—	493	15 0
					Deposit ...	—	—	130	0 0
					Cash at Bank ...	—	—	37	14 4
					Cash in Hand { Librarian ...	0	12 3		
					Secretary ...	2	6 8		
					Treasurer ...	0	16 5½		
								3	15 10½
					Total ...			£665	5 2½

We have examined the books and vouchers of the Society and certify the above Statement of Account to be correct.  
R. ERNEST RIX, } *Hon. Auditors.*  
BERNARD A. RILOT, }



## VARIATIONS IN THE MUTUAL RELATIONSHIPS OF THE UPPER AND LOWER GUM PADS IN THE NEW-BORN CHILD.\*

By LILAH CLINCH, L.D.S., R.C.S.I.

REFERENCES to this subject in the literature show considerable diversity of opinion as to the normal relations of the upper and lower gum pads; for example, Weinberger (1916) illustrated the relationships of the jaws to one another by a series of photographs of dried skulls of new-born children, which showed all stages from protrusion to retrusion of the mandible. Hellman (1914) considered that a distal position of the lower gum pad, with a space in the future incisor region between upper and lower pads, as a malrelation (Fig. 1); Friel (1926) on the other hand believed that a space was normally present and showed that the tip of the tongue

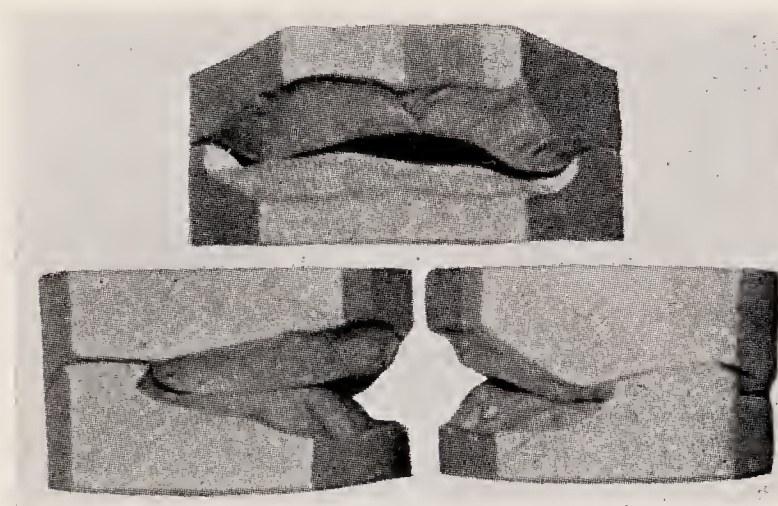


Fig. 1.

Fig. 1.—“Malrelations of the Jaws at Birth.” (Hellman, *Dental Cosmos*, 1914.)

protruded through it (Figs. 2A, B). Schwarz (1931) described the gum pads but he made no reference to any space.\* Brash (1931) called attention to the disparity in the accounts, and, in view of the diversity of opinions mentioned above, it seemed to the author to be worth while undertaking an investigation into the matter by examining a large series of living new-born children.

It is well recognised that what is a normal occlusion for the deciduous dentition may become abnormal for the permanent, and in the same way abnormal occlusion may, in rare cases, be followed by normal occlusion. In order to discover a form and

\**Transactions of British Society for the Study of Orthodontics*, 1932.



relationship which would be followed by normal occlusion of both deciduous and permanent dentitions—and would presumably be normal—it would be necessary to follow up for years the different types which are met with at birth and which are described in this paper. Since, up to the present, no such investigation has been undertaken whereby a normal standard of the relationships of the gum pads may be laid down, it must be emphasised that in this paper only the various types of relationship, as found in 500 newborn full-term children, are described, and no attempt is made to assign normality to one type rather than another. Nevertheless, there are some cases which show such definite signs of abnormality that it is hard to refrain from predicting a similar type of abnormality in the succeeding phases of development.

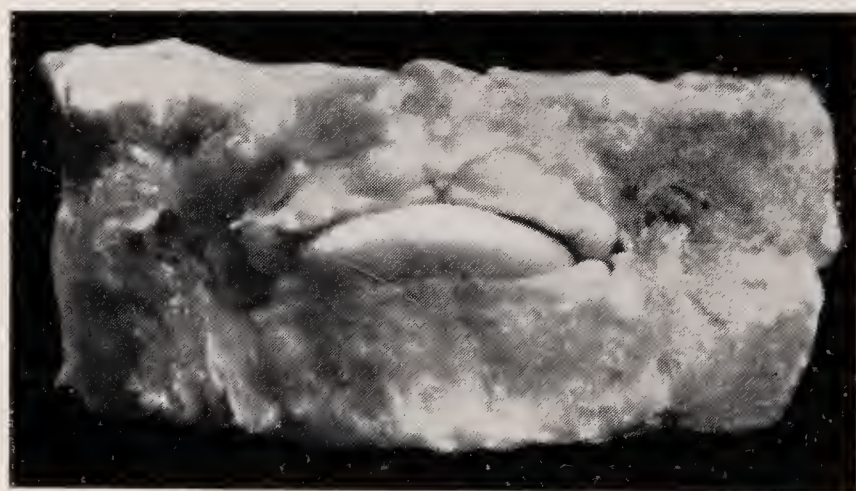


Fig. 2 (a).

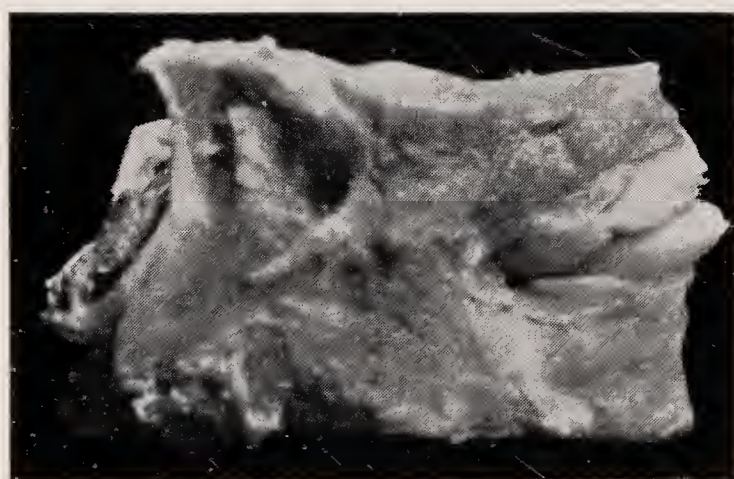


Fig. 2 (b).

Fig. 2a, b.—“Alveolar gum pads at birth, showing space between pads in anterior region through which the tongue protrudes.” (Anatomical Museum, Trinity College, Dublin.) (Friel, *Trans. 1st Int. Orthodontic Congress.*)

#### METHODS.

As a preliminary, 100 infants were examined and notes were taken on:—

(1) The actual appearance of the gum pads, with reference to the descriptions given by West (1925).

(2) The precautions necessary in approximating the gum pads so as to avoid putting undue pressure on any region, and to avoid any rotation of the mandible around the molar gum pad.

(3) The relationship of the lower to the upper pad.

The examination of these 100 infants was only of a preliminary character and the results are not included in this paper. In the course of this examination it was found that before a detailed



observation of the gum pads could be made it would be necessary to take impressions of the infants' jaws. To do this some small very light (aluminium) trays were procured which could be easily bent. These were first tried in the mouths of infants of about six months, and a number were bent into suitable shapes which could afterwards be modified to suit any unusual case. "Nadrag" impression compound was the material used, because, when taken out of boiling water—in a perfectly suitable condition for taking impressions—it is only warm and never reaches a temperature which could cause any injury to the mouth. When preparing the upper tray no impression material was put over the palatal portion, but in almost every case a satisfactory impression of the palate was procured, without any danger of choking. It was found most convenient to take the upper impression from the front, and, while the nurse held the infant and supported the head, the tray was inserted into the mouth, fixed in position, and pressure was exerted on its lower surface. The lower impression was also taken from the front. In order to occlude the models correctly, notes were taken on (*a*) presence or absence of a space in the incisor region, and, if present, the limits of the space on each side in the upper and in the lower jaw; this was made possible by the segmentation of the gums (Fig. 3); (*b*) the relation of the anterior margin of the first molar segment of the lower jaw to that of the upper.



Fig. 3.

Fig. 3.—“Ventral view of mouth of fœtus of thirty-one weeks, showing how segments of gum may resemble newly-erupted teeth.” (West. Contrib. to Embryology. Carnegie Inst., Washington.)

Seventy pairs of impressions were taken in this way, and care was taken to observe whether this treatment had any adverse effect on the children, but none was noticed either by the doctor or by the nurses in charge.



### THE UPPER GUM PAD. (Figs. 4, 5, 6a, 6b.)

The superior alveolar arch is marked along its whole length by a groove—the dental groove—which divides it into two parts, a lateral labio-buccal and a medial lingual portion ; it is through the former of these that the teeth eventually erupt, and it is this portion which constitutes the definitive gum pad. This gum pad forms a horseshoe-shaped arch which, although it varies in size, is remarkably constant in outline. In a small number of cases a tendency to narrowness in the canine region (Fig. 6B) is found, but it is scarcely noticeable and is negligible as compared with the narrowness often seen when the teeth have erupted. The gum pad is divided into ten segments which correspond to the central and lateral incisors, the canine and first and second deciduous molars

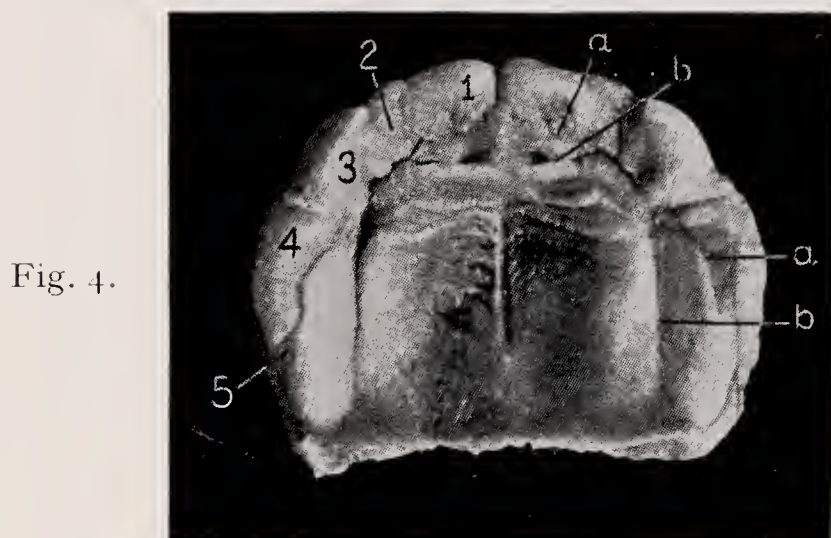


Fig. 4.

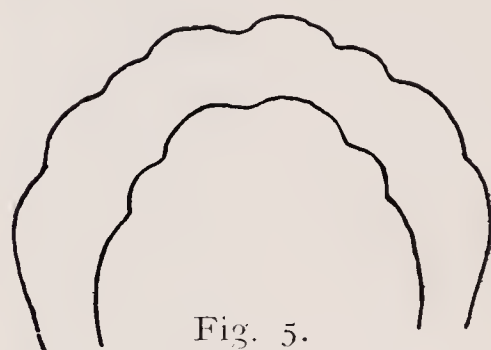


Fig. 5.

Fig. 4.—“ Gums and palate of a fœtus of twenty-nine weeks, showing dental groove (*a*) and gingival groove (*b*) enclosing the rectangular palate, and the rough nodular surface of the five segments : medial incisor (1), lateral incisors (2), canine (3), first molar (4), and second molar (5).” (West. Contrib. to Embryology. Carnegie Inst., Washington.)

Fig. 5.—Outline of outer border of gum pad. Maximum and minimum size.

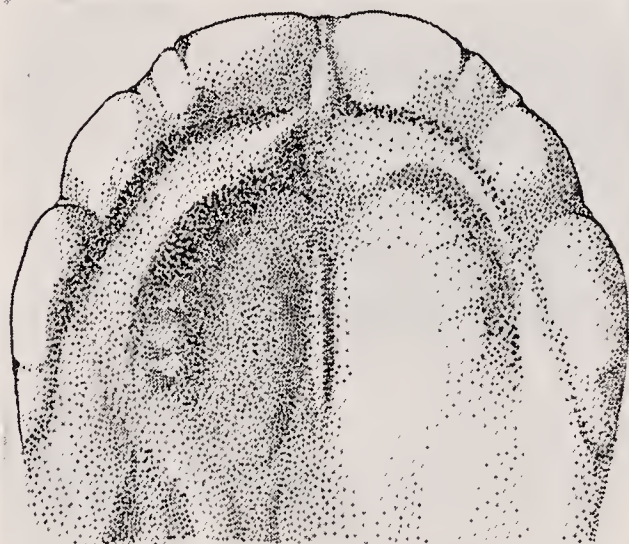


Fig. 6 (a).



Fig. 6 (b).

Fig. 6.—Drawing of upper arches, (*a*) normal and (*b*) narrow, showing segmentation, dental groove and gingival groove.  $\times 1.5$ .

of each side. The central incisor and canine segments are about equal in size and are well marked ; they are separated from the smaller lateral incisor segment, which is indistinct and sometimes lies lingual to them, by two shallow grooves. The first molar segment is the largest and is limited anteriorly by the lateral labial frenulum. The second molar segment is more difficult to recognise as it merges with the dental groove, but it can be made out lying somewhat lingual to the first molar segment, with its axis directed disto-lingually from before backwards. The gum is everywhere solid and firm, similar to that condition of the gum after complete healing and absorption of the alveolus in a healthy edentulous adult.



### THE LOWER GUM PAD. (Figs. 7A, B.)

The inferior alveolar arch, like the superior, is divided into a medial lingual and a lateral labio-buccal portion, or gum pad. Though a similar segmentation is found, the shape of the whole arch is not the same as in the upper jaw, but is more U-shaped or rectangular in form, so that the whole arch can be divided into an anterior and two lateral parts, the anterior part being formed by the four incisor segments, while the lateral parts are formed by the four molar segments, the canine segment lying in the angle between the two parts.

The anterior part is comparatively broad and is sometimes everted in front, while each lateral part has a narrow edge and is raised above the level of the anterior part. The gum is hard and firm, as in the upper jaw, but the everted edge in the incisor region, when present, is a thin flap which can be easily depressed; the segments are not so well marked as in the upper jaw.

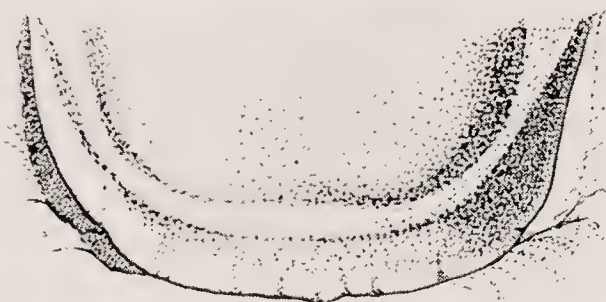


Fig. 7 (a).



Fig. 7 (b).

Fig. 7.—Drawing of lower arch. (a) From above, showing segmentation, dental groove and gingival groove; (b) from side, showing segmentation, everted edge and the first molar segment raised above the level of the incisor segments.  $\times 1.5$ .

### THE TEMPORO-MANDIBULAR JOINT, AND RELATIVE NECESSARY PRECAUTIONS.

The temporo-mandibular joint of the new-born child is not such a secure structure as in the adult, for the reason that there is no articular eminence, and the glenoid fossa is practically flat. A post-glenoid tubercle is present, but it is hardly sufficient to prevent dislocation of the jaw, so that the whole articulation depends for its stability on the strength of the ligaments surrounding the joint. Attention has been called to the fact that the molar segments of the gum pad stand up above the level of the canine and incisor segments, and it can thus be seen that if an attempt is made, without due care, to approximate the gum pads in the incisor region, the molar segments will act as a fulcrum round which the jaw will rotate, with a tendency, when the incisor regions of upper and lower jaw are approximated, to withdraw the condyle from the shallow glenoid fossa. On this account it was necessary to discover how much force could be exerted in approximating the gum pads without displacing the condyle, and it became evident that if blanching of the pads occurred the pressure was excessive. It was only with much practice that it was possible to be confident that undue pressure was not being used, and the nurses who assisted became very expert in holding the mandible in position while the examination was being made.



## RELATIONS OF LOWER TO UPPER GUM PAD.

In the 400 children who were examined, subsequent to the 100 experimental cases, the relations of upper and lower gum pads fell into three main classes :—

(1) Those in whom the lower arch was slightly lingual to the upper arch, in the incisor and in the molar regions ; this class comprised 280, or 70 per cent.

(2) Those in whom the lower arch was slightly lingual and distal to the upper in the molar region, but definitely distal in the incisor region ; this class comprised 108, or 27 per cent.

(3) Those in whom the lower arch was definitely lingual and distal in both molar and incisor regions ; this class comprised 12, or 3 per cent.

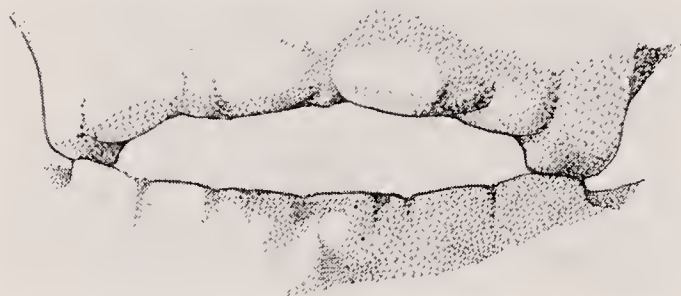


Fig. 8 (a).



Fig. 8 (b).

Fig. 8.—Drawing of gum pads in occlusion. Type 1, Subclass A. Lower arch slightly lingual to upper arch in both incisor molar regions. Vertical space in incisor region. (a) Front view, (b) side view.  $\times 1.5$ .

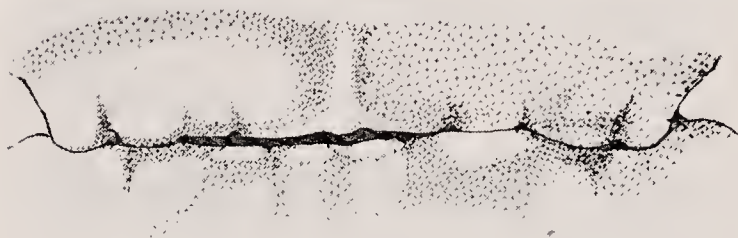


Fig. 9 (a).



Fig. 9 (b).

Fig. 9.—Drawing of gum pads in occlusion. Type 1, Subclass B. Lower arch slightly lingual to upper arch in both incisor and molar regions. No vertical space in incisor region. (a) Front view, (b) side view.  $\times 1.5$ .

### *Type 1. (Figs 8, 9.)\**

In all cases of this type the pads meet in the region of the molar segments just as, later on, provided the occlusion is normal, the lower molars lie lingual to the upper ; the anterior margin of the first molar segment lies slightly anterior to the anterior margin of the upper first molar segment. The members of this Type 1 are divided into : (a) those who have a vertical space in the incisor region ; (b) those who have not a vertical space in the incisor region.

Sub-class (a) contains 204 or 73 per cent. of the total of 280 in this Type 1. The space in the incisor region is that which has been figured by Friel and considered by him to be normal. It extends backwards as far as the canine segments, and is produced

\* Photographs of the models, from which Figs. 8, 9, 10, 11, 12, 15, 16 and 17 have been drawn, are included at the end of the paper.



by a distinct flattening of both upper and lower gum pads; the lower pad in the incisor region is particularly broad antero-posteriorly and forms a shelf on which the tip of the tongue lies during rest.

Sub-class (*b*) contains 76 or 27 per cent. of the total of 280 in this Type 1. In these cases the flattening in the upper incisor regions is not found; but the edge of the lower incisor gum pad is everted, and it is on this everted shelf that the tongue lies. In order to enable the tongue to come to lie between the pads, a tilting of the mandible takes place round the molar segments as a fulcrum, as was described above.

Fig.  
10 (a).

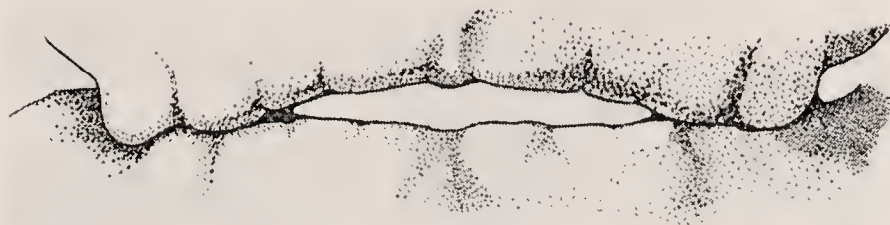


Fig. 10 (b).



Fig. 10.—Drawing of gum pads in occlusion. Type 2, Subclass A. Lower arch slightly lingual and distal to upper arch in molar region and definitely distal in incisor region. Vertical space in incisor region. Space less than in Type 1, Subclass A. (*a*) Front view, (*b*) side view.  $\times 1.5$ .



Fig. 11 (a).



Fig. 11 (b).

Fig. 11.—Drawing of gum pads in occlusion. Type 2, Subclass B. Lower arch slightly lingual and distal to upper arch in molar region and definitely distal in incisor region. No vertical space in incisor region. (*a*) Front view, (*b*) side view.  $\times 1.5$ .

*Type 2.* (Figs. 10, 11.)\*

The essential features of this type are that the mandible appears to have undergone an actual distal displacement, whereby the anterior borders of the lower molar segments, instead of being anterior, come to lie posterior to the anterior borders of the corresponding segments of the upper jaw, and, indeed, in many cases the children show a decided appearance of mandibular retrusion. This type may be divided as in Type 1: (*a*) those who have a vertical space in the incisor region; this sub-class contains 46 or

\* Photographs of the models, from which Figs. 8, 9, 10, 11, 12, 15, 16 and 17 have been drawn, are included at the end of the paper.



42 per cent. of the total 108 of Type 2 ; (b) those who have not a vertical space in the incisor region. This sub-class contains 62 or 58 per cent. of the total 108.

In this type the lower gum pad, in the incisor region, is not in contact with the upper arch owing to the distal position of the mandible ; on this account it is more difficult to distinguish those cases in whom a vertical space is present ; actually there is always a space, but in sub-class (b) it is bounded above by the palate and is not visible from the front as in sub-class (a).

In all these cases the tongue lies on the lower pad and the tip does not usually come as far forward as the upper incisor segments, but lies pressed behind them.



Fig. 12 (a).

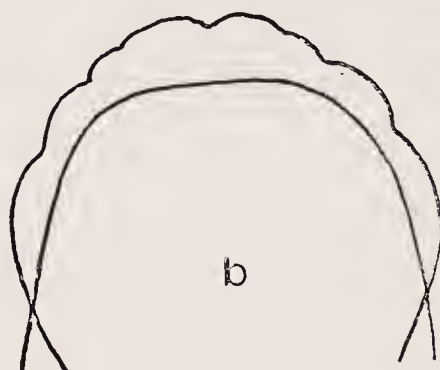


Fig. 12 (b).

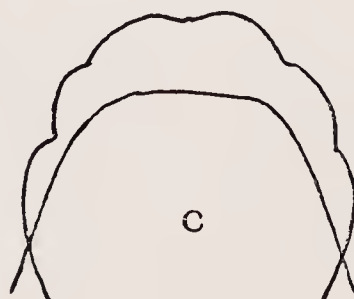
Fig. 12.—Drawing of gum pads in occlusion. Type 3. Lower arch definitely lingual and distal in both molar and incisor regions. No vertical space in incisor region. (a) Front view, (b) side view.  $\times 1.5$ .



a



b



c

Fig 13.

Fig. 13.—Outlines of outer borders of gum pads. (a) Type 1, (b) Type 2, (c) Type 3.



*Type 3.* (Fig. 12.)\*

Though the number of cases falling into this type is small, they do seem to form a definite class apart from Types 1 and 2. In these cases the lower pad is smaller over its entire area than the upper, and seems to fit up into the palate so that no space is possible anywhere, as the upper segments everywhere overhang the lower. The tongue is very small and lies pressed up against the hard palate, very distal to its position in Types 1 and 2.

With reference to Weinberger's paper, mentioned above, the author was unable to find one case of mandibular protrusion among all the 500 children examined.

	<u>A (with space.)</u>	<u>B (without space.)</u>	<u>Total.</u>
<u>Type 1.</u>	204 (73%)	76 (27%)	280 or 70%
<u>Type 2.</u>	46 (42%)	62 (58%)	108 or 27%
<u>Type 3.</u>		12	12 or 3%
	250	150	400

Fig. 14.

Fig. 14.—Table showing a comparison of the numbers in Type 1 (Subclasses A and B), Type 2 (Subclasses A and B) and Type 3.

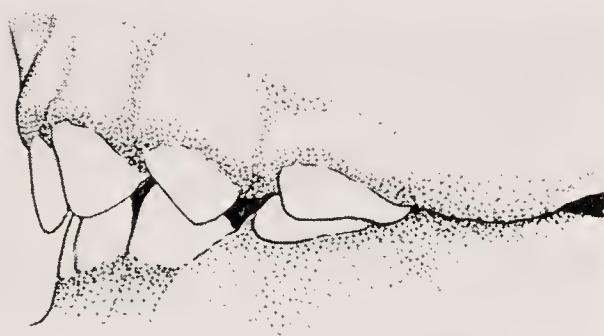


Fig. 15.

Fig. 15.—Drawing of side view of arches in occlusion, 18 months, showing second molar gum pads in occlusion.  $\times 1.5$ .

It is of considerable interest to notice that it is always the molar segments of the gum pads which are in occlusion (Fig. 15), but the incisor teeth of upper and lower jaw are the first to erupt, and where a space is present in 62 per cent. cases, there is room for this to occur (Figs. 15, 16). When the incisors are nearing full eruption the space is maintained by respective upward and downward growth of the lower and upper molar segments; the degree of

\* Photographs of the models, from which Figs. 8, 9, 10, 11, 12, 15, 16 and 17 have been drawn, are included at the end of the paper.



overbite appears to depend on the presence or absence of the vertical space in the incisor region between the gum pads.

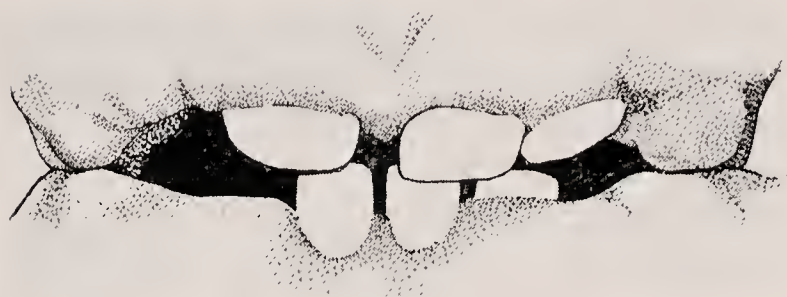


Fig. 16 (a).

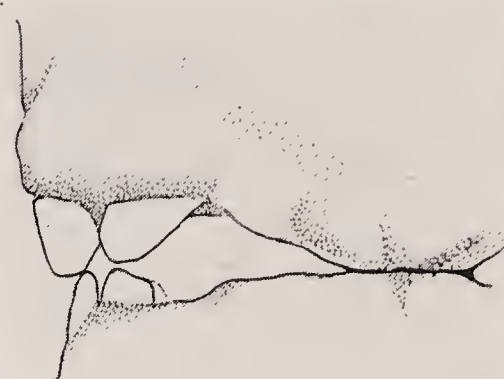


Fig. 16 (b).

Fig. 16.—Drawing of (a) front and (b) side views of arches in occlusion, 13 months, showing vertical space in incisor region. Normal overlap of upper incisors over lower incisors. Molar gum pads in occlusion.  $\times 1.5$ .

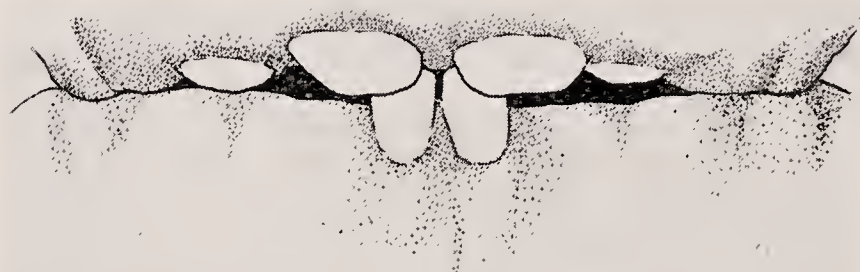


Fig. 17 (a). \*



Fig. 17 (b).

Fig. 17.—Drawing of (a) front and (b) side views of arches in occlusion, 13 months, showing slight vertical space in incisor region, but not sufficient to prevent an excessive overlap of upper incisors over lower incisors. Incisal edge of lower incisors in occlusion with upper gum. Molar gum pads in occlusion.  $\times 1.5$ .

\* Photographs of the models, from which these figures have been drawn, are included at the end of the paper.



A few measurements were taken on the models, between well-defined points. Each measurement, or character, was chosen to illustrate the differences in size and shape which have already been described. Also, as far as possible, the various measurements were taken in a manner comparable with that employed by Miss Smyth in her investigation on children of 2 to 5 years. The results obtained have been analysed statistically by Dr. M. Young, and his tables and comments are appended. It will be seen that, although the numbers of cases in the various groups are comparatively small, yet in several instances there are differences which are statistically significant. It is also of interest to note that the correlation between one pair of characters in the present investigation is almost identical with the comparable correlation in the children of two to five years already mentioned. The details are described by Dr. Young.

In conclusion, I should like to express my thanks to Dr. Solomons, the Master of the Rotunda, for allowing me to carry out this work in the hospital, and to Sister Clery for putting every facility at my disposal.

I am also indebted to Professor Brash and Professor West for the loan of slides; to Professor Dixon for demonstrating to me the changes in the temporo-mandibular joint in skulls in the Anatomical Museum of Trinity College, Dublin; to Dr. Northcroft for advice and for having articulators made for the models; to Dr. Friel for the loan of slides, for suggesting that this work should be done, and for his help in planning it; to Miss Smyth for her advice and help in measuring the models.

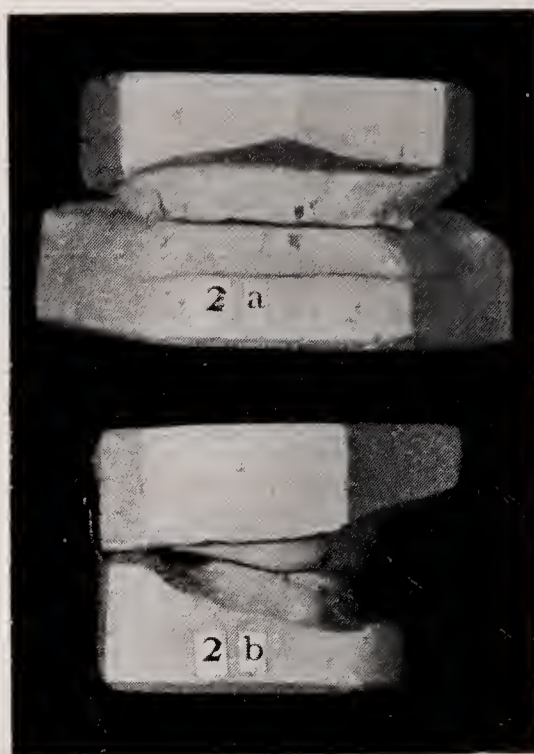
Special thanks are due to Professor West, Dr. Northcroft, Dr. Friel, Mr. McKeag, Mrs. Lindsay and Miss Smyth for reading this paper and giving many valuable suggestions.

The drawings are the work of Miss E. C. Humphreys.

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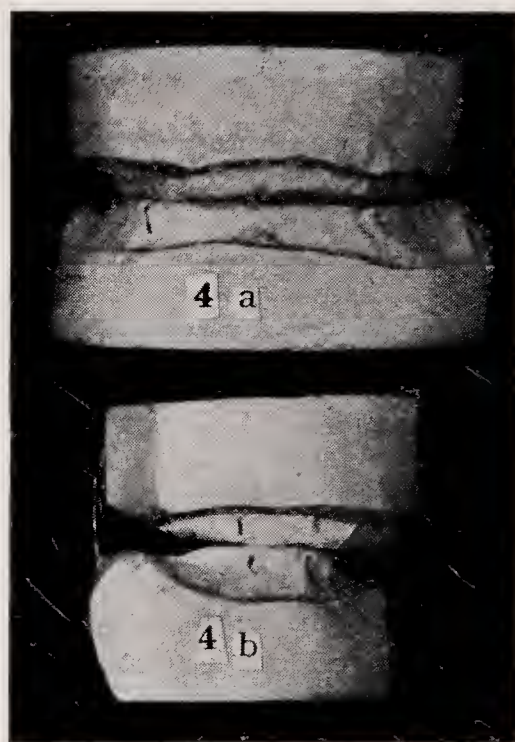
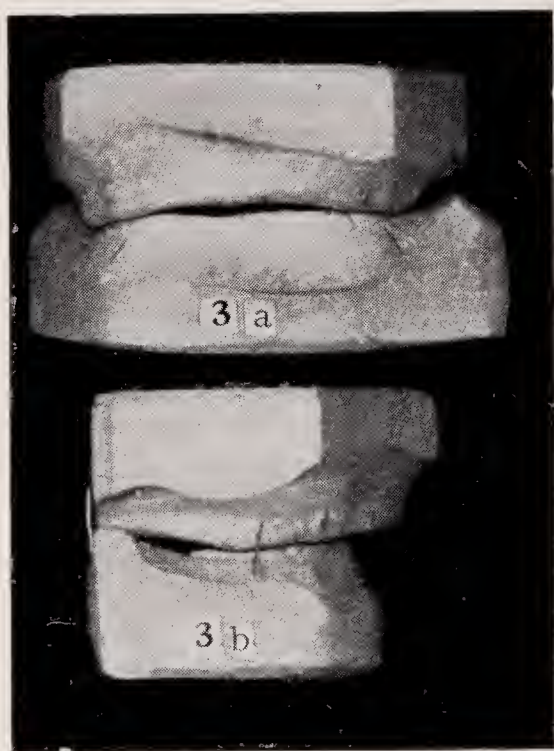
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PHOTOGRAPHS OF THE MODELS FROM WHICH FIGS. 8, 9, 10, 11, 12, 15, 16 and 17 have been drawn.



No. 1.—Gum pads in occlusion. Type 1, Subclass A. Lower arch slightly lingual to upper arch in both incisor and molar regions. Vertical space in incisor region. (a) Front view. (b) Side view. Age 4 days.

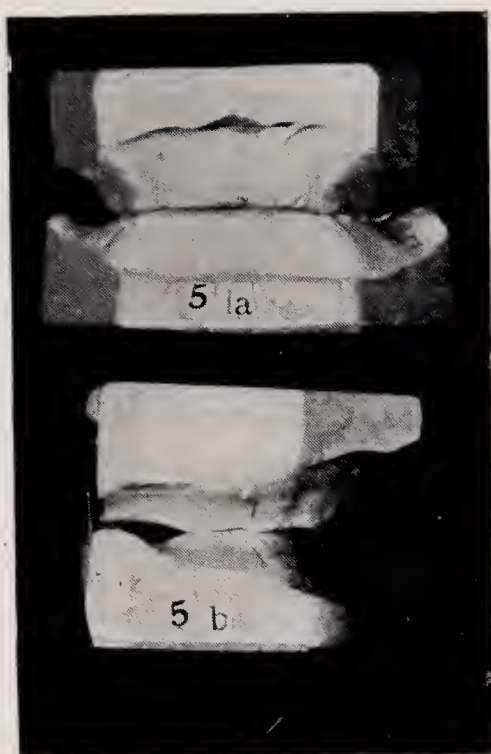
No. 2.—Gum pads in occlusion. Type 1, Subclass B. Lower arch slightly lingual to upper arch in both incisor and molar regions. No vertical space in incisor region. (a) Front view. (b) Side view. Age 4 days.



No. 3.—Gum pads in occlusion. Type 2, Subclass A. Lower arch slightly lingual and distal to upper arch in molar region, and definitely distal in incisor region. Vertical space in incisor region (space less than in Type 1, Subclass A). (a) Front view. (b) Side view. Age 3 days.

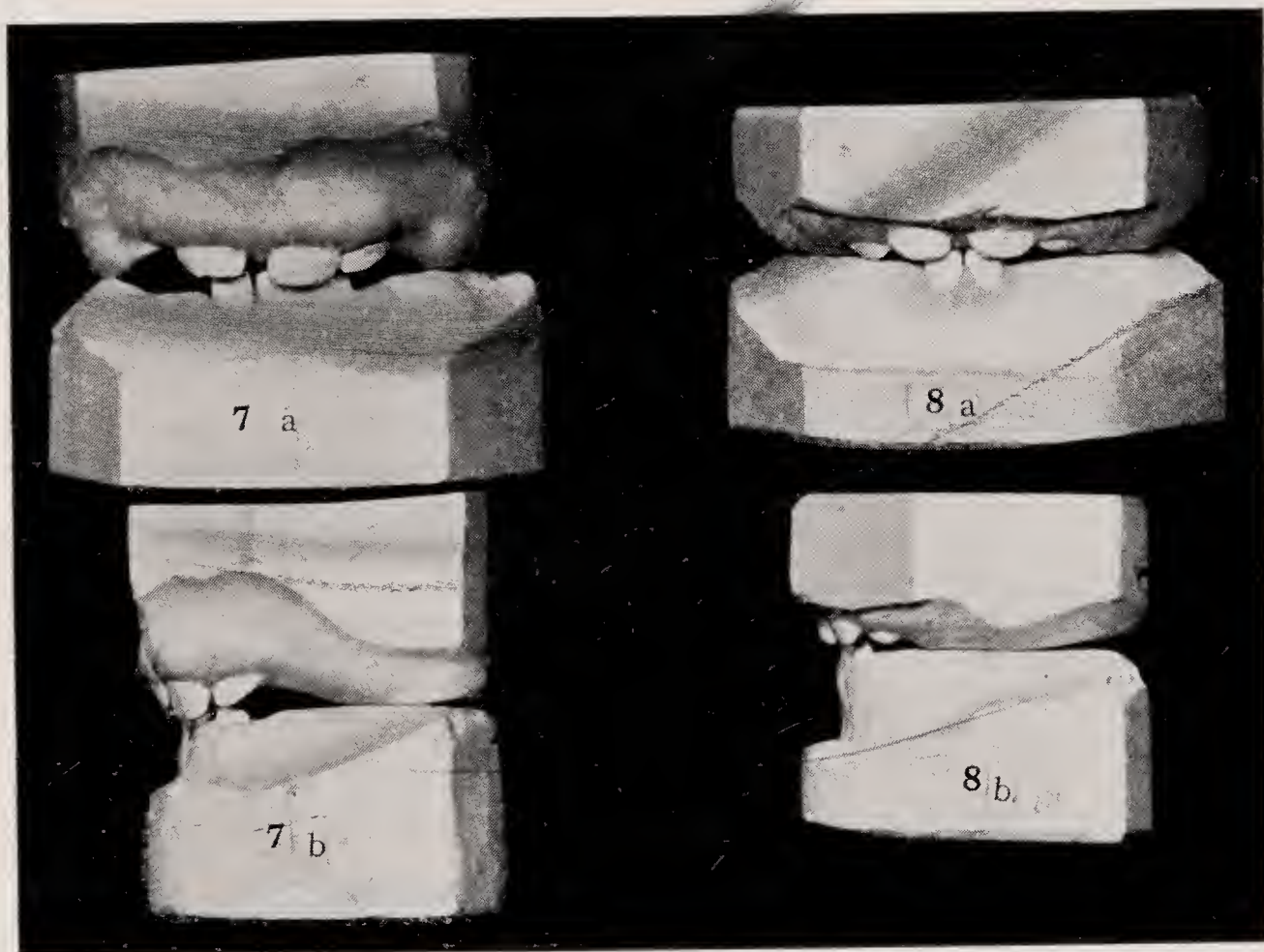
No. 4.—Gum pads in occlusion. Type 2, Subclass B. Lower arch slightly lingual and distal to upper arch in molar region, and definitely distal in incisor region. No vertical space in incisor region. (a) Front view. (b) Side view. Age 5 days.





No. 5.—Gum pads in occlusion. Type 3. Lower arch definitely lingual and distal in both molar and incisor regions. Overlap of upper incisor segments over lower incisor segment. (a) Front view. (b) Side view. Age 5 days.

No. 6.—Side view of arches in occlusion, showing gum pads in occlusion in the region of the second deciduous molar segments. Age 18 months.



No. 7.—Models in occlusion, showing vertical space in incisor region, normal overlap of upper incisors over lower incisors, molar gum pads in occlusion. (a) Front view. (b) Side view. Age 13 months.

No. 8.—Models in occlusion showing slight vertical space in incisor region but not sufficient to prevent excessive overlap of upper incisors over lower incisors. Incisal edge of lower incisors in occlusion with upper gum. Molar gum pads in occlusion. Age 13 months.

The following section is included by kind permission of Dr. Matthew Young.

DESCRIPTION OF CHARACTERS.

UPPER JAW.

- No. 1. Depth of palate from highest point of first molar segment.  
,, 2. Length of arch from the labial portion of crest of incisor ridge to the most distal point of second molar segment.  
,, 3. Breadth of arch at distal canine groove, buccal side.  
,, 4. Breadth of arch at widest portion of first molar segment, buccal side.

LOWER JAW.

- ,, 5. Length of arch from the labial portion of crest of incisor ridge to the most distal point of second molar segment.  
,, 6. Breadth of arch at distal canine groove, buccal side.  
,, 7. Breadth of arch at widest portion of first molar segment, buccal side.

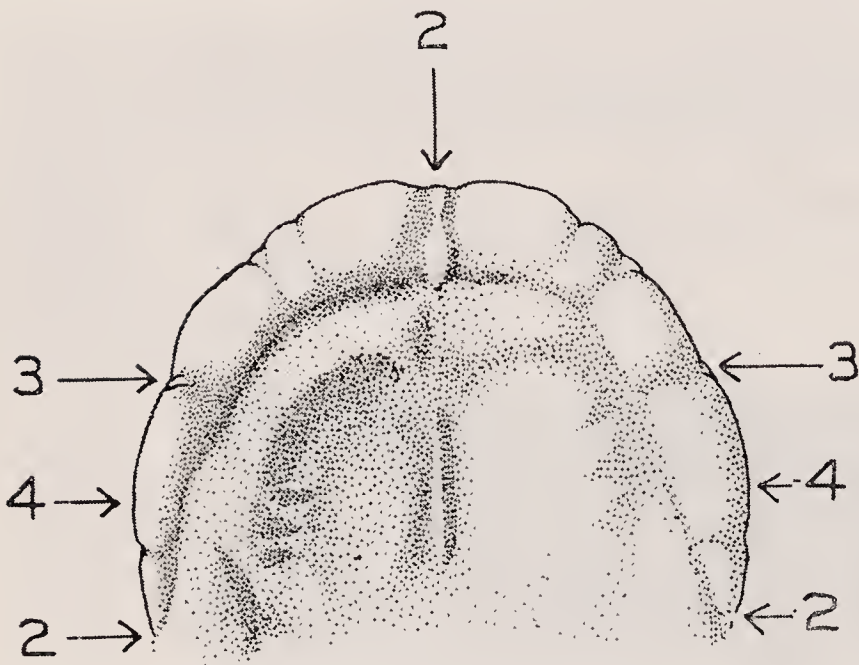


Fig. 18.

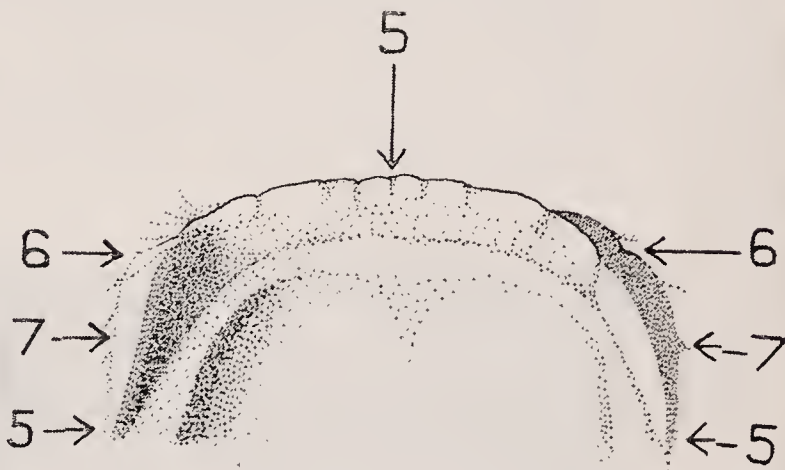


Fig. 19.

Fig. 18.—Drawing of upper arch, showing points of measurement.  $\times 1.5$ .  
Fig. 19.—Drawing of lower arch showing points of measurement.  $\times 1.5$ .  
These correspond with the characters described.

TABLE I.

Showing a comparison of the Mean Measurements of the characters in the different Groups.

Characters.							
Types.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
1A	7.42 (19)	21.06 (19)	25.58 (19)	31.21 (19)	17.43 (19)	21.79 (19)	26.37 (19)
1B	6.73 (13)	20.84 (12)	24.62(13)	30.00 (13)	18.63 (12)	21.54 (13)	25.62 (13)
2A	7.15 (13)	21.82 (12)	<u>25.38</u> (13)*	29.77 (13)	16.94 (12)	<u>23.23</u> (13)*	26.77 (13)
2B	8.04 (12)	21.28 (8)	<u>23.50</u> (12)	29.83 (12)	15.48 (8)	<u>21.23</u> (12)	25.67 (12)
1 (A + B)	7.14 (32)	20.98 (31)	25.19 (32)	30.72 (32)	<u>17.90</u> (31)*	21.69 (32)	26.06 (32)
2 (A + B)	7.58 (25)	21.60 (20)	24.48 (25)	29.80 (25)	<u>16.31</u> (20)	22.32 (25)	26.24 (25)
A (1 + 2)	7.31 (32)	21.35 (31)	<u>25.50</u> (32)*	30.69 (32)	17.24 (31)	22.38 (32)	26.53 (32)
B (1 + 2)	7.36 (25)	21.02 (20)	<u>24.03</u> (25)	29.92 (25)	17.48 (20)	21.44 (25)	25.64 (25)
3	8.75 (4)	20.50 (1)	24.00 (4)	29.50 (4)	16.00 (1)	19.50 (4)	22.75 (4)

\*Only those means which are underlined can be considered to differ to a significant degree in the number available.



In Table 1 are shown the mean measurements of the characters in the comparable groups. Though many of the pairs of averages compared appear to show appreciable differences, only four of the differences are of such a size that on the numbers available they can be considered real or significant when tested by the appropriate method for small samples. The means where the differences may be considered real are underlined. The mean breadth of the arch at the distal canine groove in both the upper and lower jaws (Nos. 3 and 6) in Group 2A is significantly in excess of the corresponding breadth in Group 2B. The same mean breadth in the upper jaw in Group A (1 + 2) is significantly in excess of that in Group B (1 + 2). The mean length of the arch in the lower jaw in Group 1 (A + B) is significantly greater than the corresponding length in Group 2 (A + B). The averages in Group 3 are based on such small numbers of observations that no comparison between them and the corresponding values in the other groups is warranted.

TABLE 2.  
Showing the Correlation Coefficients ( $r$ ) found between the several pairs of characters and those found between closely analogous measurements in children from 2 to 5 years of age.

<i>Characters.</i>	Children 2 to 5 years (Miss Smyth's data).	
	$r$	$r$
Nos. 2 and 5	.690 $\pm$ .073 (52)	.653 $\pm$ .062 (87)
Nos. 2 and 4	.547 $\pm$ .097 (52)	.246 $\pm$ .100 (88)
Nos. 5 and 7	.178 $\pm$ .134 (52)	.361 $\pm$ .093 (88)
Nos. 3 and 4	.709 $\pm$ .064 (61)	—
Nos. 6 and 7	.720 $\pm$ .062 (61)	—
Nos. 1 and 4	.090 $\pm$ .127 (61)	.144 $\pm$ .106 (86)

The interrelationships of the several pairs of characters may be of interest and is shown by the correlation coefficients which are given in Table 2. The correlation between the lengths of the upper and lower arches is represented by a coefficient of .69 which is practically identical with that found between the closely analogous measurements in children from 2 to 5 years. The correlation between the length and width of the upper arch is moderately high, about .5, but there is no significant association between the corresponding characters in the lower jaw. There is no appreciable association between the width of the arch and the height of the palate.

#### DISCUSSION.

Dr. SHELDON FRIEL remarked that Miss Clinch was to be heartily congratulated on her excellent paper, and the Society should also be congratulated on having a member who would undertake such a difficult piece of research work. Such an investigation required a considerable amount of pluck: to take one hundred impressions of infants under eight days of age and to examine a further four hundred infants; it was, however, the large numbers which made Miss Clinch's paper so valuable and gave her conclusions and observations so much weight. This work was not, he continued, of purely academic importance; it was of great practical value, for it filled a gap and straightened a confusion in our knowledge of the stages of occlusion, and anything that increased the knowledge of occlusion was of great practical importance to orthodontics. Not only had Miss Clinch filled that gap, but she had opened up several new avenues for future research. Two of these new lines had struck the speaker as important, and the first of them was the large percentage of post-normal cases. Were these cases, he asked, a definite inhibition of growth of bone which would afterwards be shown when the teeth erupted, or were they merely a delayed development which would catch up with the normal by the time the teeth erupted? A considerable amount of research would be needed to follow up these cases, and it would be

necessary to know something more about the stages of development in the embryo. The second line of research which he thought important was the meaning of the space in the future incisor region. Miss Clinch had put forward a very plausible explanation: that it had to do with the amount of overlap of the upper over the lower incisors. He thought that there existed a certain amount of support for that view, apart from what she had told the meeting, in the very large percentage of the space present in the cases that had normal antero-posterior relationship and the very large percentage of lack of the space in those with a posterior relationship. As was well known, post-normal occlusion and close bite were very closely related, and it seemed quite possible that Miss Clinch had hit upon the first evidence of close bite. Many things had been said from time to time about the narrow view-point of specialists in orthodontics. It had been held that unless they kept the thirty-two teeth in the patient their case was a failure. Dr. Friel said that he did not think that this remark was true. Orthodontists, particularly the specialist members of the Society, realised just as much as any other dental surgeon, and possibly even more, that any definite inhibition of growth of bone seldom completely recovered, and that a perfect result could not be obtained without the removal of certain teeth in these very difficult cases. A specialist in orthodontics was not only one who practised the art exclusively—a very minor point—but one who had the necessary manipulative ability, and, above all, one who was willing to undertake research work and hand on the knowledge to his fellows. The specialists of the Society had tried to live up to that standard, and Miss Clinch, a member of the small band of London specialists, was no exception. Dr. Friel concluded by repeating his thanks for her paper.

Mr. NORTHCROFT said that he would not like the occasion to pass without paying a tribute to the indefatigable work that Miss Clinch had put into the preparation of her valuable paper. The work in this or any country was unique; it was full of interest and planned on truly scientific lines. The Society felt grateful to Miss Clinch that evening, and would feel still more grateful to her in time to come. The observation of five hundred cases of infants at this very early age displayed an amount of patience that was seldom found outside the lecturer's own sex. Speaking personally, he had become tired after taking models from a mere hundred children between the ages of 2 and 5; what it must be to take impressions of four hundred infants between 2 and 4 days old he left to the imagination. He had taken some impressions of his own first-born boy at the age of 14 days, using the old-fashioned yellow beeswax, which he had found a very satisfactory substance. Nadrag had not been invented in those days, and even so he would have hesitated to use it. The difficulty was that the plastic substance must remain soft for some little time, because the surgeon had to seize his opportunity when the infant was crying to pop the mould into its mouth; the taking of these impressions was quite a problem. The speaker said that he had had to make his own impression trays; he asked whether Miss Clinch had found any on the market or whether she had made all her own trays. He had not realised at first how tiny the trays had to be, and only found out by experiment. Miss Clinch had demonstrated very clearly the classes into which her cases fell. Mr. Northcroft agreed that the apparently open space in the front of the mouth in which, as Dr. Friel had shown, the tongue protruded, occurred in the cases which were not going to have a close bite later on—and all members knew what a terrible bugbear the close bite was in later orthodontic work. Miss Clinch had very generously presented five of her models to the Odontological Section of the Museum of the Royal College of Surgeons, where they could be seen by earnest students at any time.

Mr. S. A. RIDDETT inquired whether Miss Clinch's Type 1 cases were mostly followed by normal occlusion, and if Type 2 were the smaller number which might or might not be followed by post-normal occlusion. He asked whether the Type 2 space was considerably smaller than the Type 1.



Mr. A. L. PACKHAM then asked if the lecturer would explain how she had articulated the models. In infants 4 days old the glenoid cavity was practically a plane surface, and therefore the condyle of the mandible could move in practically every direction. It could certainly move forward, and even if it could not move backward, it could move to the left or right. Most members would have experienced considerable difficulty in articulating correctly the two models of an edentulous elderly patient; one could assume therefore some difficulty in estimating the exact occlusion of the models in question. He inquired how Miss Clinch could say that the two models were in the position of rest. It had also occurred to him, he said, that the space between the upper and lower gum pads might be associated with the act of sucking. It was not actually unknown for a child to be born sucking its thumb, and he had heard of infants who had sucked their thumbs on the first, second and third days of life.

Mr. McKEAG suggested that he could supplement Miss Clinch's explanation of how the accurate articulation was recognised. She had kindly allowed him to accompany her to the hospital where she had been making the investigation and he had realised how difficult the work was, and also that it was quite possible to be satisfied that the gum pads were in their natural relationship. The comparison with edentulous jaws was not a fair one, because edentulous jaws were not made to fit together and did not naturally fit together, and gave the observer that impression at once. While it was obviously necessary to have, as Miss Clinch had, a standardised technique for getting the relationship, that technique was necessary for maintaining the same angle of view, and did not seem to be important for recognition of the correctness or otherwise of the relationships of the jaws.

Miss CLINCH thanked the Society for the reception given to her paper. In reply to Dr. Northcroft, she said that she had found it necessary to make the trays herself; she had done so by cutting down larger sized trays to suitable shapes. She would like to assure the President that the illustrations were photographs of genuine models; as none of the children had been over eight days old, she had not inquired for thumb-sucking habits.

Mr. Packham had asked a question which could only be satisfactorily answered by a demonstration on an infant; there was undoubtedly a definite bite, but it was only after the examination of a considerable number of children that one became convinced of this; having once discovered this fact, it was comparatively easy to place the mandible in its position of rest—using in every case the same technique. The children, strange to say, did not seem to object to the examination, and many of them made no protest. Mr. Packham had said that the space in the incisor region might be associated with the act of thumb-sucking. As all the infants were under 8 days of age, she thought this was improbable—indeed, many of the children 1 and 2 days old had pronounced spaces; of course, if the infant had been born sucking its thumb, the matter was different, but she did not think that this could occur in such a large percentage of cases without some mention of it being made in the literature.

She was afraid she could not reply to Mr. Riddett's question as to whether the Type 1 cases were followed by normal occlusion; she hoped to continue this work and to follow up some cases from each type; when this had been done more information on that point would be available. The space, when present, in cases of Type 2, was considerably smaller than in Type 1.



## MOVING TEETH OVER THE BITE.

---

By MURIEL P. MICHAELIS, L.D.S.

BEFORE presenting my communication I should like, if I may, to apologise to the senior members of the Society, since for them I shall be dealing with a truism. It is intended for the junior members like myself, in the hope that it may lighten their labours and smooth away a difficulty which I believe to be very general.

I refer to the widespread belief among dental surgeons that it is necessary to open the bite, usually by capping some of the teeth, in order to move buccally a tooth which is lingually misplaced or "inside the bite." As a generalisation this is erroneous, but I am assured of its prevalence by Mr. Chapman's reply when I mentioned this communication to him. He told me that the idea is such a fixed one that unless one made oneself very convincing, one would not be generally believed.

Owing to the time factor I have only brought models of three cases with me. They are on the table if anyone is interested; but I think that the slides made from them will show what I mean and prove that the movement can be accomplished without opening the bite. I have chosen these three particular cases because they exemplify the type of irregularity which apparently, at any rate to the timid amongst us, cries out for the opening of the bite. Also, because the treatments carried out include the use of both fixed and removable appliances—and it is the user of removable appliances who is the harder to convince. The habitual user of finger springs on lingual and buccal bows is already among the converted.

Before showing the slides I should like to impress on you that they are intended to illustrate the point in question only. The models show other irregularities, which have or have not been treated as the cases demanded; but we are not concerned with those here, and I will ask you please to ignore them.

Slide 1 shows a case in which the left permanent lateral and deciduous canine are well inside the bite, and the left permanent central, although rotated and lingually misplaced, is in a more or less edge-to-edge occlusion with the lower central. Slide 2 shows the same case eleven months later. There had been no treatment in the interval owing to illness, and you will see that the central is more or less normal in position, but that the lateral is still lingually misplaced. Treatment to move the lateral buccally was accomplished by means of a removable vulcanite saddle plate carrying a platinised gold bar lingual to the incisors, on which was soldered a finger spring exerting pressure at the neck of the lateral. Anchorage was obtained by wire cribs round 6 | 6 carrying Visick clasps. Slide 3 shows the position of the lateral after treatment.

Slide 4 shows a lingually misplaced canine erupting rather late. This was treated by a similar plate, with a result as shown in Slide 5.

Slide 6, which shows the third case, takes rather an unfair advantage of you, I am afraid, because I have not got the final model as yet. The case is under treatment, and if members are



# MOVING TEETH OVER THE BITE.

By MURIEL P. MICHAELIS, L.D.S.

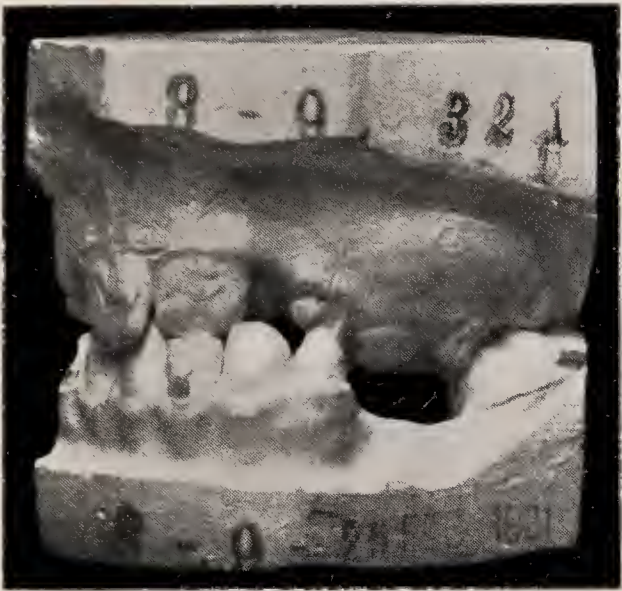


Fig. 1.

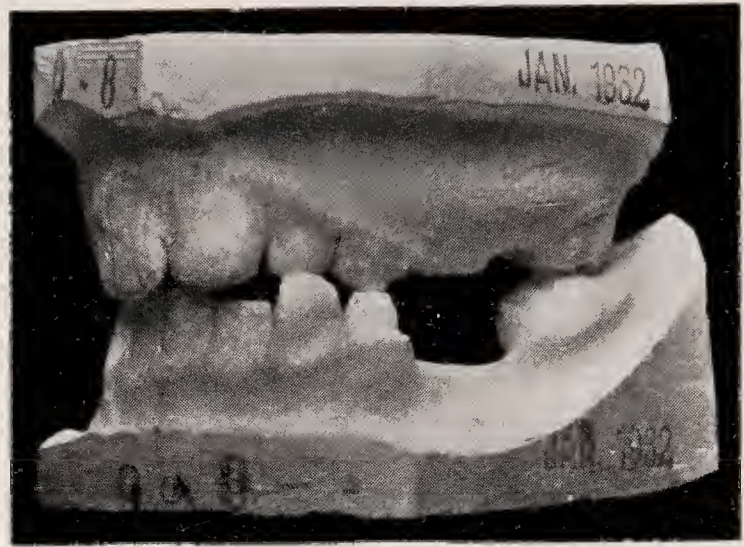


Fig. 2.

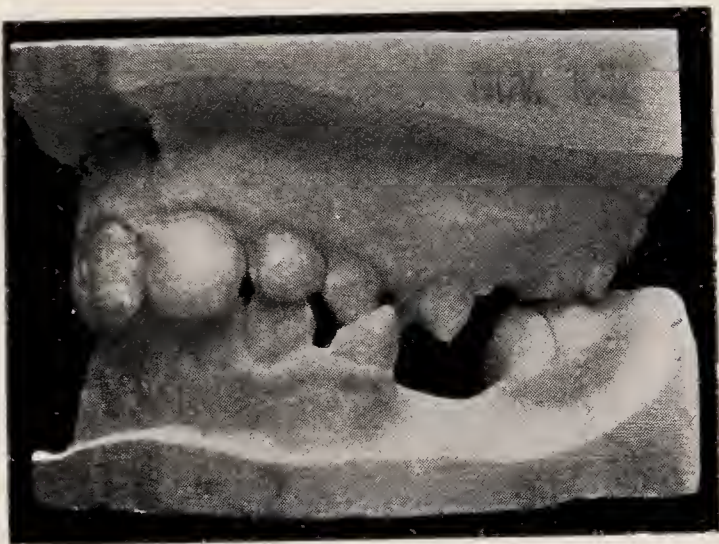


Fig. 3.

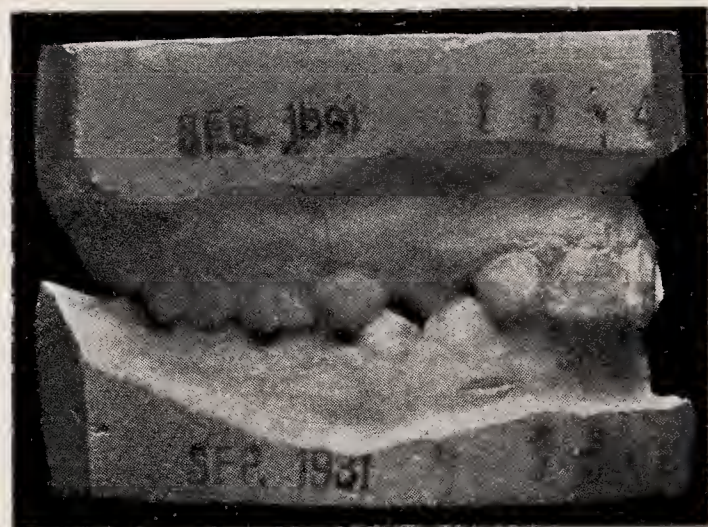


Fig. 4.



Fig. 5.

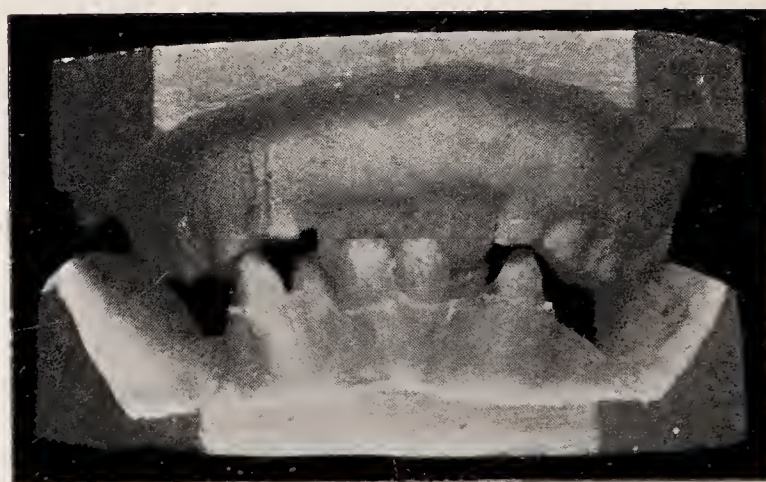


Fig. 6.







interested I will gladly show the result later. It is being treated with fixed appliances, two lingual bows carrying finger springs. I will ask you to believe that so far all is going well.

In none of these cases has the bite been opened at any time, and treatment along these lines, as opposed to one which necessitates opening the bite, obviates unnecessary interference with the occlusion and minimises the discomfort of the patient. It also allows in the case of a removable appliance, of a plate being so shaped as to come in contact with a minimum of dental tissue.

The whole misconception probably arises from our failing to appreciate the fact that the teeth are not normally kept clenched. Even with the lips closed the upper and lower teeth are slightly apart; but as this is not apparent on our models we are apt to overlook it. The difficulty is in that way a psychological one, and unless we recognise this essential difference between the model, which is passive, and the mouth, which is active, we are apt to perpetrate the fallacy of treating a model instead of a mouth.

#### DISCUSSION.

Mr. H. G. WATKIN said that he had had one case in a fairly young child of an upper central incisor inside the lower central, with rather a large overbite. Without trying to gag the bite at all, but slowly moving the upper incisor forward, he had found that the lower central had moved at the same rate by occlusion and had kept in front of the upper tooth, so that the speaker had not succeeded in getting the upper central over the lower by this method. He admitted that it was very seldom necessary to gag the bite, but there were times when it was so, particularly when there was a very large overbite in the front. In another of his cases on one side an upper molar occluded lingually and on the other side the molars occluded normally. He had had four teeth on a bow on one side working against the lingually-placed molar on the other; the four teeth had all moved out, leaving the molar on the other side still biting lingually.

Dr. BRODERICK inquired, as the most ignorant person on orthodontics in the room, whether there was not a certain length of time during which the patients were unable to close their molar teeth, even if it were only for an hour or two.

Mr. R. CUTLER (Honorary Secretary) added to Dr. Broderick's question that it was characteristic of these patients to complain of the teeth that were being moved being tender for two or three days, though treatment might be going on for some weeks, this tenderness marking the time of transition when the bite was edge to edge.

Mr. S. F. ST. J. STEADMAN doubted whether the last remark was quite correct. He thought that the tooth, as it was moved, became tender and the patient bit in such a way that he bit on the tender tooth. It was a bite of accommodation. The tooth was never quite edge to edge, because that would imply that it was shorter when it was being moved over the bite. It was, however, quite easy to move the teeth laterally over the bite.

The PRESIDENT related that Mr. Fox, a very old member, had shown a case to the Society of a young lady who had desired to be married. He had fitted an inclined plane on the lower plate, and had said that on her wedding day she had looked "perfectly lovely." The case had shown what could be done by the co-operation of the patient.

Mrs. MICHAELIS, in reply, said that she had not anticipated that her communication would rouse such a storm of protest. She did not like to contradict so senior a member as Mr. Watkin, but she

suggested that if an appliance had been put in the lower denture to prevent the teeth from moving forward, it would have been unnecessary to open the bite. She felt that opening the bite would do more harm possibly even to the temporo-mandibular joint, than the wearing of another appliance to prevent the lower teeth from moving forward at the same time. She did not know the length of the time during which the patient could not close his teeth, but she had not heard of any complaint.

Dr. BRODERICK asked whether it would be hours or weeks.

Mrs. MICHAELIS answered that it could not be very long, but that she could not give an authoritative answer, except that she had not heard of any complaints of inability to close. If the finger-strings did not exert too much pressure, there should be neither pain nor tenderness in the tooth being moved. None of her cases had complained of pain, but the process had not been hurried; two or three months had been taken for each tooth, and there had been a very slow finger-spring movement.













